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NUMBER 8

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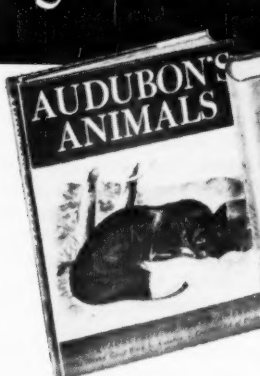
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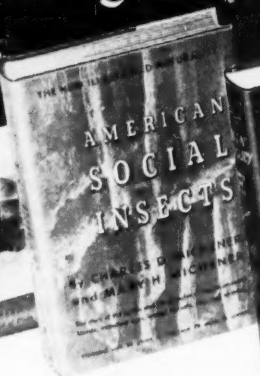
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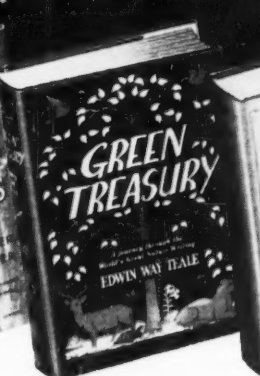
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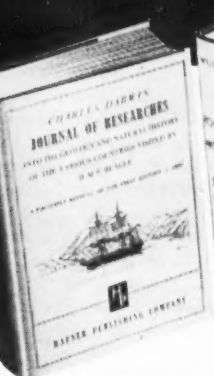
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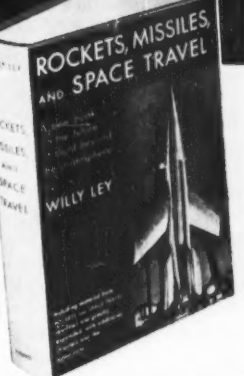
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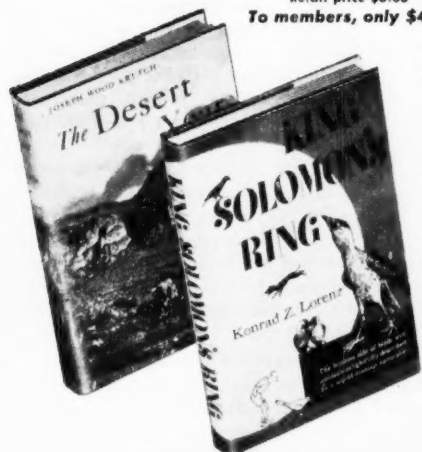
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Nature in Print

By HOWARD ZAHNISER

TWO books written out of experiences in the wildernesses of South America, which by coincidence came to me together and thus accompanied me on a journey of my own—civilized as it has been—have carried me beyond their adventures, into thoughts of the meaning to us of these wild regions, and into wonderings, as deep as the jungle, about our own human natures.

Colonel P. H. Fawcett, who made seven round-trips into the primeval backlands of Bolivia and Brazil, and who has not yet returned since he left on an eighth journey, in 1924, says that "a man, however well educated, who has once sampled extreme simplicity of existence will seldom return to the artificial life of civilization," the burden of which, he says, "is not realized until it is laid aside." In fact, he writes in another context, "the more civilized a man is the more ready he is to slough off the old life and relapse into an existence of extreme simplicity."

Yet where so-called civilized men met the simplicity of the savage, and Colonel Fawcett visited them in their harsh exploitation of earth and man, he found "every excuse" for his observation that "drink reigned supreme." "Surrounded by brutality and bestial passions," he wrote, "living in unbelievable squalor, isolated by vast distances, lack of communications, and impassable jungle, it is not surprising that people sought escape in the only way they knew—by means of the bottle."

Colonel Fawcett himself—who in England first had taken the chance to lead a South American boundary expedition as "the chance to escape from the monotonous life of an artillery officer in home stations," and then later was goaded on in a quest for "lost cities" and undiscovered country—could not abide the comfort of his English home, although he loved it and had long been absent. "Deep down inside me," he testifies, "a tiny voice was calling. At first scarcely audible, it persisted until I could no longer ignore it. It was the voice of the wild places, and I knew that it was now part of me for ever."

What, indeed, is this "voice"? And what is it that makes so exciting for us this book that Briar Fawcett has edited out of the fluent manuscripts his father wrote of the first seven expeditions, and out of other records of the eighth, from which there has been no return?

Virginia Prewett, an American newspaper correspondent in Argentina, longing for "a new world," created a homestead in Brazil's Great Forest of Goiás "to fulfill a dream of escape." Yet in this frontier, missing the tranquility she sought, she felt sharply "the raw cruelty threaded through life in the beautiful country around me." She found terror in "the fact that there was no cushioning for anything, no margin, no resource, no help." Nothing worked out for her according to plan—"not the big important things, not even the little important ones."

She wanted "to write about beautiful places and happy people," and when the flowering trees were in bloom she wrote to her own lover, "It is so beautiful that it is as hard to describe as the body of the beloved." And when, called away once from her frontier

place, she found herself returning: "All at once, the gentle hills and the far distances summoned me toward quietude." When the harshness of the frontier "scratched across the sheathing" of her heart "like a rough fingernail" and she wondered, "How could there be a place for happiness here in the midst of this cruel, slow-motion battle between man and nature?", she was tempted further into the jungle.

"Why not," came the thought, "drop all the struggle and vanish away into the quiet places beyond the edge of the brutal conflict of the frontier?"

Yet she returned to her work—and to her lover—and concluded that it had been a fallacy "to dream even for an instant there was any frontier far enough away to be outside the problems which we call the problems of the day, but which," Virginia Prewett declares, "are old problems, those of man on earth."

Summarizing all her experience, in appraising one crisis, she writes:

"I had gone to the backlands to rebuild my life in a beautiful setting, found more difficulty than I could absorb, began to dodge and became entangled in evasions. In untangling myself, I lost the common illusion that other times, other places, and other

peoples are simpler and kinder. Gone forever from my mind was the idea common among people on pavements and children in schoolrooms that refuge lies in some leafy woods, some distant forest. No longer did escape seem either possible or desirable to me."

She found that she had to go "beyond the forest," and from this discovery she has chosen the symbolic title of this book, in which she tells of these exploratory years in her life. Assured by "one of New York's most competent psychiatrists" that she was very well balanced, and corroborating this with "an equally thorough and complicated series of psychological and psychiatric tests," she concludes that "even an exceptionally well-balanced person may fall into involvement with escape after delving too deeply into the complex hopes, fears, and disappointments of the times." She failed in her expectation of finding "solace in park-like forests and lush pastures" but found, instead, that "escape came another way, through hardship and action."

Virginia Prewett herself labels as the "final thing" she had to learn, her realization of the failure of "so-called 'civilized' men" to respect the earth with its "glory of natural richness." She declares eloquently: "This beautiful savage country that fought man with a force the primitive within me could feel as a transcendental enmity, was waging a just fight, for man's penetration here was nothing more than a wanton, murderous attack, wasteful and wrong."

Colonel Fawcett's accounts carry the same conviction.

Virginia Prewett's *Beyond the Great Forest* is more, however, than the account of a particularly interesting pioneer venture in the frontier of Brazil. It is likewise the intimate testimony of a woman's spiritual adventures in arriving at the companionship of love.

"Only a heart can provide safe haven," she writes, "a place never can."

There are many engaging descriptions in *Beyond the Great Forest*, many exciting accounts of scenes and wildlife in *Lost Trails*, *Lost Cities*. Virginia Prewett tells of experiences so modern, in so understanding a fashion, as to seem to be writing a tract for the times. Colonel Fawcett's romantic and archeologic quest for the lost cities and treasures of an earlier civilization, his intrepid and "scientific" explorations as a surveyor, make of his volume one of the most fascinating of the adventure stories of highly civilized men pushing further beyond the borders of

Design

By MILDRED COUSENS

The balanced bough, the vertical tree,
The pine cone's fluted symmetry;

An oak leaf's deeply curving line,
The spiral tendrils of the vine;

A snowflake's lacy hexagon,
The crystal's bright phenomenon;

Long parallels of shore and lake,
Triangles that mountains make;

The golden circle of the sun,
A paler replica, the moon—

Such mathematics would imply
Something more than meets the eye.

the "known" world. Both books are derived from and contribute to an awareness of the primeval backlands of South America, which so well merit interest and thoughts of preservation.

Who could apprehend in one pondering the meaning of such human documents? Is it not apparent that the wild lands lure men and women irresistibly at times, promising them solace, offering them hardship and action? Yet the frontier of "wanton, murderous attack, wasteful and wrong," doing violence both to the earth and its aborigines, is so far from realizing these values of the wild lands that civilized man can hardly endure it. Can it be that only cultured man, civilized and assured of his relationships with the wilderness and with other men, can know the primeval directly and be nurtured by it? Is it only when men have fashioned a culture from the wilderness that they can return to what is left of it with true awareness of its value to them?

Beyond the Great Forest. By Virginia Prewett. New York: E. P. Dutton & Co., Inc. 1953. 302 pp. (5-3/4 by 8 1/4 in.), with end-paper outline maps of South America and the "region of the great forest." \$3.75.

Lost Trails, Lost Cities. By P. H. Fawcett, From His Manuscripts, Letters, and Other Records, Selected and Arranged by Brian Fawcett. New York: Funk & Wagnalls Company. 1953. 332 pp. (6-1/8 by 9 1/4 in.), with foreword and epilogue by Brian Fawcett, frontispiece portrait, 18 photographs on 8 plates, 2 text maps, glossary, and index. \$5.

Barrier Reef

Great Barrier Reef. By William J. Dakin. Melbourne, Australia. 1953. Australian National Publicity Association. 135 pages. Illustrated. \$2.50.

The Great Barrier Reef of Australia is the greatest coral region of the seven seas and noted for its beauty and the wonder and variety of its wildlife, its marine forms and its interesting flora. This story of the area by the late Emeritus Professor of Zoology of the University of Sydney is based upon intimate knowledge of the Reef.

Colorado Fishes

"Guide to the Fishes of Colorado" is the title of a 110-page booklet by William C. Beckman. It is the result of research jointly sponsored by the University of Colorado Museum, Colorado A. & M. College, Colorado Game and Fish Department and the U. S. Fish and Wildlife Service. A key to identification of the fishes is provided, popular information about each fish, simple drawings that will further identification and other pertinent data. There is no clue anywhere in the booklet as to just where it is available and at what price.

Parrakeets

Parrakeets. By Herbert S. Zim. New York. 1953. William Morrow and Co. 64 pages. Illustrated by Larry Kettelkamp. \$2.00.

At the present rate the parrakeet threatens to outstrip the dog in the pet popularity contest. In recognition of this Dr. Zim has done a simple little book on how to raise, train and breed these birds. The text is apparently directed at a little less than adult audience, and set in larger than the average type, but the information seems to be just what any parrakeet owner would wish to know, whatever his or her age.

Bringing up Budgie. By Alice L. Sadler. New York. 1953. Sentinel Books. 64 pages. Illustrated. Paper cover. \$75.

Budgie is short for Budgerigar, which is pet dealer parlance for the parrakeet. So this is a practical guide to caring for one of these bird pets, training it, teaching it to talk, seeing to its diet, treating its ailments, and breeding the birds as a hobby.

Dan Smythe's Poems

Man in the Land. By Daniel Smythe. Portland, Maine. 1953. Machigonne Press. 68 pages. \$2.00.

This is the fourth volume of poetry by this talented poet, many of whose fine poems have appeared in the pages of *Nature Magazine*. Dan Smythe draws most of his inspiration from Nature, of which he is a keen student. He is an established poet in the front rank and has achieved publication in most of the periodicals that appreciate and use the best in poetry. Smythe has also won many literary prizes for his work. Thus appearance of another collection of his poems will be widely appreciated.

Walton Anniversary

The Compleat Angler. By Izaak Walton, revised by Eugene Burns. Harrisburg, Pa. 1953. The Stackpole Company. 192 pages. \$3.50.

This is a tricentennial edition of this classic work, written in 1653, and it is appropriately sponsored by the Izaak Walton League of America. In an introduction, the editor, Mr. Burns, provides biographical material and some little-known facts about Walton.

Coco

Coco. By Dilys Powell. New York. 1953. Oxford University Press. 122 pages. Illustrated. \$2.75.

This is a biography. It is the biography of Coco, a poodle. The author does not pretend that Coco is a dog hero, or that he could ever achieve the fame of Lassie, or other noted canines. However, Coco is well known to television audiences in Great Britain, and is a personality. Coco's mistress is a London film critic and she has written a charming story of this personable poodle.



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Beatty's Cabin

Beatty's Cabin. By Elliott S. Barker. Albuquerque, N. M. 1953. The University of New Mexico Press. 220 pages. \$4.50.

This is a story of the Pecos high country of New Mexico and adventure there. Elliott Barker has devoted his life to wildlife conservation as New Mexico's fish and game administrator. He loves the outdoors and all that is in it, and writes of it with a genuineness and understanding that carries the reader into the outdoors with him. He dedicates this book to his wife, Ethel, "who, after forty-two years, three children, and nine grandchildren, still loves to pack back into the beautiful Pecos high country with me to fish for trout and to camp beneath a canopy of drooping spruce boughs at the edge of some pristine, flower-spangled park."

Historic Dogs

Historic Dogs. By B. F. Griffith. Haverford, Pa. 1953. Clinton L. Mellor. 90 pages. Illustrated. \$3.00.

This is an outline, in picture and text, of the history of the dog, from the earliest records to the present day. The author has delved into the first early art in which dogs were depicted, such as the Cantabrian, in which the early forms of the Alsatian shepherd dog were apparently drawn. She has studied later art, in which various breeds became more and more evident. Then followed research into the travels of the dog, and the gradual development of new and fixed breeds. This is a quite different and completely fascinating book for anyone interested in dogs.

Warblers

Life Histories of North American Wood Warblers. By Arthur Cleveland Bent. Washington, D. C. 1953. U. S. Government Printing Office. 734 pages, with 33 plates. \$4.50.

Appearance of another one of Arthur Cleveland Bent's *Life Histories* of birds is always an event, and this is the nineteenth such event. Warblers are a challenge to all bird observers, and they constitute one of the most fascinating families of birds. This latest addition to the Bent series, therefore, will be received with special enthusiasm and read with great interest. This volume follows the plan of its predecessors.

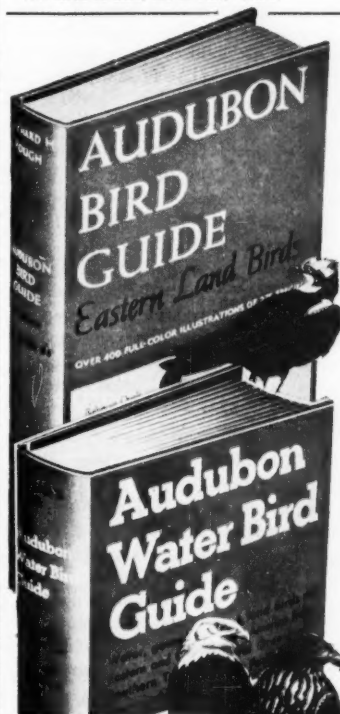
L. H. Bailey

From Philip Dorf, 101 Orchard Place, Ithaca, New York, comes request for assistance. He is collecting material for a biography of Liberty Hyde Bailey. He would appreciate hearing from anyone who has known the great botanist and philosopher, and can contribute interesting information. Any original Bailey letters will be handled carefully and returned promptly.

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Sierra Wildlife

Birds and Mammals of the Sierra Nevada. By Lowell Sumner and Joseph S. Dixon. Berkeley, California. 1953. University of California Press. 484 pages, with eight color plates, and black and white illustrations and maps. \$7.50.

While this notable volume is designed for those who visit the Sierra Nevada and wish to know the birds and mammals found there, it is of wider application as a guide to the regional fauna. Study that forms the basis of this volume was actually begun in 1916, with work on the wildlife of the Kings Canyon area. Many other studies followed, some of them intensive work in National Park areas. Joseph Dixon passed away in 1952 after a long illness, but his manuscript material was combined with that of his co-author and the results of their work now appear in this valuable book.

Aboriginal Australia

Adam in Ochre. By Colin Simpson. New York. 1953. Frederick A. Praeger. Illustrated in color and black and white. 221 pages. \$5.00.

In this book we find a fascinating popular account of the largest scientific expedition into aboriginal Australia. This was a joint effort of the Smithsonian Institution, the National Geographic Society, and the Commonwealth of Australia. The destination was Arnhem land, an area into which the white man does not carry his expansion, and where the natives continue to live as they have done for centuries. In addition to interesting information about aboriginal life, the expedition brought back specimens and data about the plant and animal life of the country, including hitherto unidentified species. The author is a journalist, science and radio writer, and this book has zoomed to the best seller class in Australia. It should achieve a comparable audience in the United States.

Great Dane

The Great Dane. By Virginia Keckler. Chicago. 1953. Judy Publishing Co. 172 pages. Illustrated. \$3.50.

The author of this book is a breeder of numerous champion Great Danes. In the book she provides a complete discussion of the history of the breed and the care, breeding, training and exhibiting of this dog.

Earth Life

Life on the Earth. By Rose Wyler and Gerald Ames. New York. 1953. Henry Schuman. 143 pages. Illustrated. \$2.50.

In this book the authors present a popular report on the modern discoveries of the science of life, biology. They present a clear introduction to life on earth and how it came about, its development and its relationships, one form to another.

Babies

All Kinds of Babies. By Millicent Selsam. Illustrated by Helen Ludwig. *The Four Little Foxes.* By Miriam Schlein. Illustrated by Luis Quintanilla. New York. 1953. William R. Scott, Inc. \$2.00 each.

These two attractive little books about young animals are aimed at a quite young audience with its instinctive love for animals. They are attractive little introductions to a knowledge of Nature.

Aquariums

Freshwater and Salt-Water Aquaria. By Francis G. W. Knowles. New York. 1953. The British Book Centre. 174 pages. Illustrated. \$2.75.

This is a practical guide to setting up, stocking and maintaining either a freshwater or a salt-water aquarium. Although published in Great Britain, the information contained in the book is largely applicable to situations in the United States.

Plant Morphology

Plant Morphology. By Arthur W. Haupt. New York. 1953. McGraw-Hill. 464 pages. Illustrated. \$8.00.

This is a textbook for the student who has completed a course in general botany and moved on to advanced work. The author, who is Professor of Botany at the University of California at Los Angeles, places special emphasis on the evolution of the plant kingdom as seen through a documented comparison of the morphology of the major groups.

Red, the Fox

Little Red the Fox. By Joseph Wharton Lippincott. Philadelphia. 1953. J. B. Lippincott Co. 128 pages. Illustrated by George F. Mason. \$1.85.

This is a new and revised edition of the story originally published under the title of *Red Ben, the Fox of Oak Ridge*. It is a sympathetic story by one who is a lover, student and writer of the outdoors. We can stand some friendliness toward the fox these days.

A Boy and His Danta

The River Horse. By Nina Ames Frey. New York. 1953. William R. Scott, Inc. 150 pages. Illustrated by Renée George. \$2.50.

The central figure in this little story is a young Mayan Indian who lived on the shores of Guatemala's Lake Atitlán. One thing he coveted, as he heard the story of his ancestors, was a horse. Finally, in the forest with his father, he saw a danta, a little wild horse, and he returned to the forest alone to get his horse. This is the setting for his adventures.

Cactuses

Cactus and Other Succulent Plants. By H. M. Roan. New York. 1953. The British Book Centre. 80 pages. Illustrated. \$3.00.

This is a third edition and fifth printing

of this British book, the title of which is descriptive. While written from the point of view of a grower in Britain, the information on culture and care is of general application.

Briefly Noted

Beautiful Flowering Shrubs, Trees and Heather. By G. Clarke Nuttall. New York. 1953. The British Book Centre. 258 pages. Illustrated. \$4.50.

Revised edition of this British book for the grower of shrubs and trees.

Arizona Hide-Out. By Frances McGuire. New York. 1953. E. P. Dutton and Co. 128 pages. \$2.50.

Adventure fiction with an Arizona background. For boys, and, probably, girls.

The First Book of Space Travel. By Jeanne Bendick. New York. 1953. Franklin Watts. 70 pages. Illustrated by the author. \$1.75.

Popular discussion of what can be, and what probably will not be, in crashing the frontiers of space.

The First Book of Sailing. By Marion Lineaweaver. New York. 1953. Franklin Watts. 70 pages. Illustrated by Jack Coggins. \$1.75.

A practical guide to small boat sailing by one of long experience.

Tony Sees It Through. By Ralph Edgar Bailey. New York. 1953. E. P. Dutton. 224 pages. \$2.75.

Juvenile fiction with an agricultural and dairy farming background.

The Social Insects. By O. W. Richards. New York. 1953. Philosophical Library. 219 pages. Illustrated. \$4.75.

Popular discussion of the bees, wasps, ants and termites by a British authority.

British Crags and Climbers. By Edward C. Pyatt and Wilfrid Noyce. New York. 1953. The British Book Centre. 235 pages. Illustrated. \$4.50.

Anthology of British mountaineering literature for climbers and non-climbers.

Trees for Town and Country. Compiled by the Association for Planning and Regional Reconstruction. 1953. Distributed by the British Book Centre. 132 pages. Illustrated. \$5.50.

A selection of sixty trees suitable for general cultivation in England.

British Wild Animals. By R. L. E. Ford. New York. 1953. Macmillan. 95 pages. Illustrated. \$1.35.

Popular discussion of Britain's mammal life.

Climate, Vegetation and Man. By Leonard Hadlow. New York. 1953. Philosophical Library. 288 pages. Illustrated. \$4.75.

Discussion of the effect of climate upon life—human, plant and animal.

Rare and Extinct Birds of Britain. By Ralph Whitlock. New York. 1953. The British Book Centre. 224 pages. Illustrated.

The first thorough survey of Britain's rare and extinct birds that has been made in many years.

Contents Noted

TWENTY percent of the eighteen million trout planted in California waters this year will be under the influence of sodium amytal, a hypnotic-type barbituate drug. It seems that with a half-grain of the drug in a gallon of water less water is required in transporting the fishes. This is because the amytal calms the trout down so that they need less oxygen, thus less water. This experiment is said now to be out of the experimental stage, and once-drugged fish that have been observed for many months show no visible effects of the drug. And there is no danger to the fisherman who catches and eats the trout. Once, following an appendectomy, we were given some amytal, with the result that we jabbered more than usual and with little control over what we were saying. These California fishes, we would guess, from our own experience, will probably be telling some tall fish stories.

DURING the fiscal year from July 1, 1952 to June 30, 1953, the U.S. Forest Service contributed \$76,500,000 to the Federal Treasury. This came from the sale of timber, the leasing of land for grazing, power or recreation, and from other special uses. This contribution is five million dollars more than the revenue for the preceding year. It would seem, in the light of this income, that there would be more widespread support in the Congress for legislation ear-marking ten percent of this income, up to a maximum of \$5,500,000, to be expended for the development, management and use of public areas in the national forests, and for the improvement of wildlife habitat. The recreational use of the forests has grown tremendously, and will continue to do so, but funds available for even such basic essentials as sanitation are woefully inadequate. It is to be hoped that at the next session of Congress the importance of this problem will be recognized.

ILLINOIS continues to hold its unenviable place as a "backward State" so far as wildlife conservation is concerned. After approval by the House, the State Senate recently defeated, by a vote of 21 to 18, a bill that would have placed the mourning dove on the protected list and brought Illinois into line with nearby States. The gunners are, apparently, still in the saddle, so this attractive and valuable bird will continue to serve as a target, for it has no other importance to the gunner than to challenge his marksmanship. Then, from Frank Bellrose, waterfowl biologist of the Illinois Natural History Survey, comes sad news about the status of the wood duck in Illinois. Habitually nesting in this State, and the only waterfowl that do so, this bird has been reduced close to the point of extinction. During the past waterfowl hunting season gunners took far more wood ducks than ever before because, says Dr. Bellrose, "there were no other ducks for them to shoot during a great portion of the season." Also, the recent Illinois Legislature extended protection to

the woodchuck in the northern zone of the State. This step was taken, however, out of no solicitude for the woodchuck but because gunners complained of too few rabbits to shoot. Rabbits use woodchuck burrows in which to raise their families. Of course, wildlife administration in Illinois is still largely political, which explains a lot of things that happen.

ALso in the area of waterfowl administration is disturbing news that reaches us from California. On the Sacramento National Wildlife Refuge winter the remaining small population of Ross's goose, a diminutive white goose that is numbered among the rare birds. They nest in far northwestern Canada and, although protected by law, too many are shot by gunners, who allegedly mistake them for the much larger and common snow geese. Now, however, pressure is building up to demand that the Sacramento Refuge be opened up to shooting, which would inevitably doom the little goose to extinction. It begins to appear that selfish elements among migratory waterfowl hunters feel that they are in the driver's seat again with the present administration of the Department of the Interior and the Fish and Wildlife Service. Partial elimination of the baiting ban in the announcement of seasons for mourning doves, rails and gallinules suggests that this may be the case, and the general waterfowl regulations may serve to convince us further in this direction.

SOMEWHAT more liberal regulations governing the hunting of migratory ducks and geese were announced by the Secretary of the Interior. Longer seasons by five days are approved for the Atlantic, Central and Pacific flyways, while the Mississippi flyway season remains the same as last year. Hunting hours in all flyways have been liberalized, by adding an hour at the end of the day, shooting being permitted until sunset. Except for the birds using the Atlantic flyway, field studies do not indicate any increased production of the birds in the breeding areas, or prospect of increased flight compared to 1952, although the flight is expected to be above the five-year average. All flyways will have a fifteen-day "experimental" season for shooting the Wilson's snipe, which has been protected since 1941. It seems obvious that the policy of the Fish and Wildlife Service today is to please the gunner. Its real responsibility is to protect the resource.

WHAT amounts to little more than a "stay of execution" for the diminutive Key Deer of the Florida Keys is provided by the appropriation bill, for the fiscal year 1954, of the Department of the Interior. The Fish and Wildlife Service is authorized to lease and manage lands on which these deer live, and to take over the cost of patrol and fire prevention, previously borne as a stopgap by the Boone and Crockett Club and the National Wildlife Federation. But the owner of the leased lands may cancel the lease at any time. So the deer, in good physical condition now, are by no means assured of permanent protection. R.W.W.



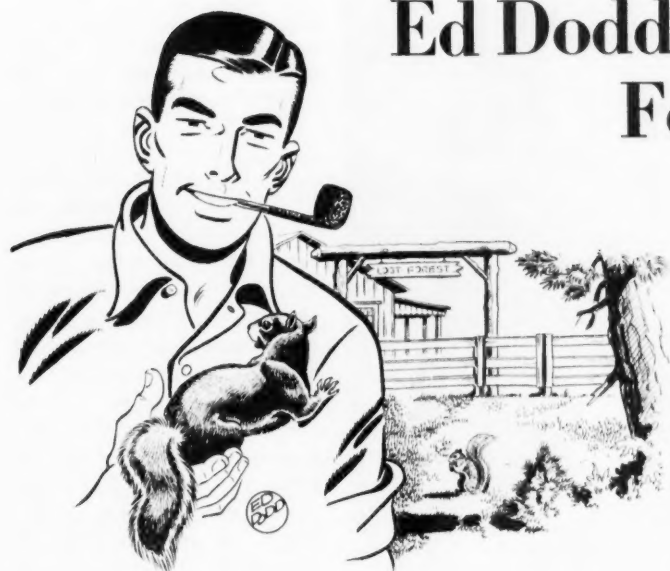
Favorite at the stables at Ed Dodd's Lost Forest near Atlanta, Georgia, is "Dusty." Horse and cartoonist enjoy a little understanding talk.

Ed Dodd, Laird of Lost Forest

By MAREL BROWN

Photographs by Hugh Stovall,

Drawing by Ed Dodd



WHEN Ed Dodd dreamed up a woodland paradise as a background for his famous outdoor strip, "Mark Trail," he had no idea at the time that his pen-and-ink "Lost Forest" would actually come to life. But it *has* come to life, and it promises to surpass in reality the well-known game refuge and bird sanctuary familiar to the "comic strip" readers of nearly three hundred American and Canadian newspapers.

Fifteen miles north of Atlanta, in a wild woodland of a hundred and thirty acres, the cartoonist is developing an "outdoor laboratory" that is already a Nature lover's oasis. Experiments in all types of conservation and game management are carried on, and, if found successful, are either drawn or written into Mr. Dodd's conservation strip, or described in well-illustrated articles which appear in leading magazines.

Before you have climbed the first hill leading from the rustic cabin up to the spring-fed lake, you realize you are in a strangely familiar setting, for these scenes have all appeared, at one time or another, in the daily or Sunday "Mark Trail" strip. Being meticulous about authentic backgrounds and accurate drawings is one of the things this Georgia-born artist insists upon, and the real "Lost Forest" serves as a perfect model for the sanctuary in the cartoon.

Mr. Dodd is generous in sharing his conservation ideas and experiments with anyone who is at all interested, and great numbers of people are using the "Lost Forest" techniques on eroded lands, in building artificial lakes, and in the encouragement of all wildlife.

Ed Dodd and "Dusty" in front of the stables at the entrance to the real Lost Forest, and, above, Mark Trail and the entrance to the Lost Forest of newspaper strip fame.

After talking to Ed Dodd for a short time it is easy to see that his major concern is the preservation of our natural resources. He feels that we have seriously neglected our woods, waters, wildlife, and soil, and that we must fight continually to save them from utter ruin. He is especially serious about our water and our topsoil, which is disappearing at an alarming rate. His belief is that other resources, such as forests, birds, and wildlife, will thrive when these two are well managed.

Just like Nature-loving Mark Trail, whom he created for his cartoon strip—and who is really Ed Dodd reduced to cartoon dimensions—this notable Atlanta artist had rather spend his time outdoors and tramping the woods than sitting at a drawing board. He would rather work at the business of creating the real "Lost Forest," or relax on a long, hard hike into woods or fields, than write the tense dramatic sequences that keep reader-interest of the thirty million circulation at high pitch.

The hot afternoon we tramped his roads and trails was exactly two years to the day after he had bought this wooded area near the Chattahoochee River, where much of the big pine timber had been cut and sawed twelve years before. A fine stand of young pines has





The falls at Lost Forest, which provides the cartoonist with authentic background material for his famous newspaper strip.

reclaimed several hillsides, and many young oak, hickory and poplar trees are rapidly turning other cleared areas into promising hardwood forests.

But, as is true with untended, hilly Georgia land, especially after a sawmill crew has stripped it, the Dodd land has a network of deep gullies that carry topsoil rushing down to Marsh Creek during every big rain. My "has" really should be "had," for Mr. Dodd's expert erosion-cure program is rapidly checking eroded spots. His lespedeza plantings are holding the soil loss to a minimum, and already the red land is showing a new crust of topsoil. *Lespedeza sericea* has been planted on some new wagon roads that were cut to haul out timber taken from the lake basin and to bring in loads of rock for building walls and bordering trails. This plant holds water, preventing new gullies, and provides ground cover and feed for wildlife.

On sloping portions of the drain ditches that run around the long lake for the purpose of turning wash water from the hillsides into the stream below the dam, lespedeza slows the rush of water and holds the soil. Across the lake, on a slope where red clay was taken to build the dam, is a green stretch of second-year planting.

"The advantage of this kind of lespedeza," Mr. Dodd explains, "is that it reseeds itself. What you see there across the lake, and what covers the road down this hill and in that drain ditch alongside the dam, was planted last year. The stand that came up this spring is worth far more in a conservation project than any amount of fancy retaining walls I could have built. Planted field roads remain open for occasional heavy hauling, yet they are not gully-hazards, as unplanted stretches would be on these hills. It's also good quail cover."

the East, North, West, or South, has much to contribute to the nation's enjoyment and well-being, added: "I wanted to get the fish started, even in a small lake. I can increase the size of the lake as time and money allow."

The lake is stocked with bluegills and black bass, and already they provide good fishing and eating for him and his neighbors. "Yes, every weekend there'll be a dozen or more boys—and a good many grown boys!—swimming and fishing here in the lake. Sure! I invite anybody in the neighborhood to come fish. They all feel the lake is their's to enjoy, too. That way they take good care of it, and I'm not bothered with anyone sneaking in just to take out the fish and leave the lake and shoreline littered with trash. They all help me with the work of making the place a beauty spot for people and a sanctuary for wildlife."

The banks of the lake are landscaped between the drain ditch and the irregular shoreline. Young swamp willows, a few weeping willows, masses of rhododendron, wild azaleas, ferns, and an increasing number of native plants and grasses give it a park-like appearance—besides filtering the rain water to prevent soil drainage into the lake. Several clumps of cattails, which he planted in shallow inlets, "to look pretty," have to be kept in check to prevent rapid growth that would clog good fishing places.

Above the drain ditch is an irregular row of white pines, part of three thousand small seedlings that are not native to middle Georgia. He obtained these from the North Carolina Forestry Department and scattered them throughout his hills. Besides their unusual beauty, white pines provide dense shade and good nesting for birds.

Ed Dodd is especially proud of the multiflora rose he set out in rows and masses to fill many open spots. "The multiflora rose," he informed me, "will eventually grow to a height of eight feet and form a thick, thorny hedge six feet across. Quail and rabbits consider it choice housing. In a game preserve it is important to provide plenty of good cover for both birds and small mammals. Song birds thrive on such cover, too. These bushes are less than two years old, but they will really be valuable in a few years. Their blooms are pretty in spring, and birds eat the berries in fall."

As we walked from the lake down to the creek level I noticed that each tiny gully had been blocked by strategically placed stones. The bottom land is deep with rich topsoil that has washed down in previous years, but this has now been virtually stopped.

Following the creek bank, Mr. Dodd has cut out a wagon road that also serves as a bridle path. There some giant original pines, overlooked by the sawmill people, stand sentinel against further inroads into this "Lost Forest" quietude. Overhanging maples, poplars, sweetgums, red birches, and hickories make just the sort of road Mark Trail would love to ride or hike. The creek road is part of a network of Nature trails Mr. Dodd is blazing out to cross and wind into every part of his 130 acres.

At one or two places along the creek trees washed down by torrential rains in previous years have turned the water in such swift currents that it is undermining large trees on the opposite bank. In one place, where a choice virgin pine was in jeopardy, anchored brush and small trees are being banked under the pine, and the fallen trees are being removed. Clearing the whole creek bed will prevent further flood damage.

"It takes a lot of work to reclaim land that has been allowed to deteriorate," Ed Dodd assured me, "but the results are worth it. Already there's a big improvement in this creek bank and much less damage this year than last. Here you'll see what is being done after the creek leaves the woods and cuts deep across the bottom land, snake-fashion."

Along each bank Mr. Dodd has planted kudzu vines, considered by many as the most

rapidly growing vine available. Even in one year's time long runners of kudzu are gripping the sandy banks and beginning to ward off the snarling tongues of angry water every time the creek rises. Wire-anchored brush taken from cleared land and willows are helping hold the banks until the kudzu gets a firmer grip. "Keeping your soil on your own land is a problem anywhere in hill country," he warns, "but holding it back is a 'must' if a farmer wants to grow good crops, or if he wants to turn open land into a wildlife preserve. I'm growing vegetables and some corn in these bottoms, but they are sidelines. I grow some small winter grain, and cut some grass fields for hay to feed the two horses I use for models in drawing my strip. But the main object of exerting my time and money—and sweat these hot summers—is to preserve what is here of both flora and fauna, and make a place that will attract more game birds and small animals."

Already Mr. Dodd has seen muskrats, mink, red and gray foxes, raccoons, opossums, rabbits, squirrels, quail and doves on his place. He believes it is not necessary to add small animals, but that when protected, with food and cover provided, they will multiply in sufficient quantities. Later he plans to add some deer, but they will have to be fenced. Cave-like recesses under boulders that jut out from some heavily wooded hills are super-deluxe quarters for the fox. Migrating wild ducks have discovered his lake, and he hopes some ducks will be attracted there permanently.

Mr. Dodd grins a little when he says he believes he is prouder of his barn and paddock than he is of the cabin. The big brown barn has four stalls, a first-class workshop, ample storage for grain and hay, and a covered walkway surrounding it. Years spent unning

Ed Dodd fishing Big Rock Lake at Lost Forest. The fringe of dogwood on the far shore is just blooming. This is an artificial lake, now three years old and producing excellent fishing.



Ed Dodd and a neighbor inspect mountain laurel on the Lost Forest reserve to see how much it has been pinched by late frost.



a dude ranch in Wyoming gave him a feeling for good barns, and much of his time is spent in this barn workshop.

The creek winds around back of the barn where it dips into some dense woods and comes tumbling out in a series of cascades that hurtle over huge boulders to form a series of waterfalls. Using boulders for footage, we jumped across churning water to the opposite side. Pointing up to a high bluff where banks are thick with huge rhododendron bushes and large hardwood trees, he shouted above the roar of water, "Up there is where I expect to build my studio, overlooking these falls. The highway runs close by up there and a studio will be easy to reach. But I particularly want this view of the falls from my easy chair!"

The little cabin he has already built, partly of lumber from his own place, seems house enough for a bachelor who had rather be outdoors than in. His hours inside are spent with a bunch of other Nature-loving cronies sitting in white oak split chairs and settees before the big stone fireplace, exchanging outdoor experiences. On warm summer days these discussions are carried on while lounging on the long open porch that overlooks the bottoms and the pasture, enjoying the view between two towering virgin pines that frame the valley.

One wall of the cabin is filled with framed citations and honors that have come to Mr. Dodd for his work through the years in behalf of wildlife conservation—most of them for the good he has done through his cartoon strip. Prominent among the honors are the United States Forest Service Conservation Award for 1952; The Detroit Sportsman's Club Award for 1950; the 1951 Citation from the National Association for Conservation, Education and Publicity, and the Sigma Delta Chi "Distinguished Service Award" for 1948—the first time such recognition was ever awarded from that newspaper fraternity to a cartoonist.

Since this wildlife preserve is off on a side road from the Roswell-Atlanta highway, about three miles from Sandy Springs, Mr. Dodd had to install his own lighting system and waterworks. The kitchen is equipped with

all the customary conveniences, and the huge stove in the corner stands ready for cooking fish, rabbit or quail, according to season.

"I know everything here looks 'in the rough' now, but it takes time to cover up worn land, supply water and cover for the wildlife, and make the whole thing into a park where friends, Boy Scout organizations and groups of city-bred young people can see what goes on in the woods. As civilization spreads a small wilderness area such as this becomes increasingly important. That's why I'm protecting all the dogwood and redbud trees, rhododendron, and wild honeysuckle, ferns, and wildflowers wherever they are growing. I'm also transplanting these wild plants and trees along the Nature trails and around the house."

Mr. Dodd wiped perspiration from his forehead and added: "I'm having great fun developing this place. My neighbors are beginning to share my enthusiasm, and we all get a whale of a lot of satisfaction from knowing we are doing something of value in our conservation effort. Anybody can do the same type of thing with land in any part of our country. Also, I'm proud of this place because it gives me authentic, first-hand information on conservation, which I can pass on through my friend Mark Trail to the many Americans who are interested in the preservation of our woods, waters, soil, and wildlife."



Vacation Memo:

By DEAN TAYLOR

Nothing is louder,
(And I have proof!),
Than a small raccoon
On a cabin roof;

And a few of life's jolts
Can quite compare
With finding the garbage can
Full of bear!



The Sunny South Side of the Reconstructed Greenhouse.

This view, taken from the flower garden with its boxwood maze, shows long wings flanking the taller central building, or conservatory. In Washington's time the wings were used as servants' quarters. The left, or west wing, is now a small shop where publications and colored slides of Mount Vernon, as well as potted ivy and boxwood, are on sale.

Mount Vernon's New-Old Greenhouse

By E. JOHN LONG

Photographs from The Mount Vernon Ladies Association

IF YOU have never been to Mount Vernon, or if you have not visited it since 1949, you have a surprise coming, and a pleasant one. Along the north side of the flower garden rises a handsome red brick building. Third largest structure on the estate, it represents the most ambitious project of its kind yet undertaken by the Mount Vernon Ladies Association of the Union, custodians of the historic home of George Washington along the Potomac.

The new edifice is the reconstructed greenhouse, the only major building on the plantation that has had to be completely rebuilt from its foundations. Restocked with many of the tropical or "exotic" plants mentioned in Washington's writings, or the reports of gardeners and visitors, it marks a long step forward in the Association's carefully developed plans to recreate the Mount Vernon that the First President actually knew and loved so well during his years of residence there.

It is most appropriate that the greenhouse should be in flourishing operation this year, because 1953 is the 100th anniversary of the efforts of a frail little woman from South Carolina to save the beautiful plantation from ruin. In December, 1853, Ann Pamela Cunningham founded the Mount Vernon Ladies Association, became its first Regent, and sparked the long, hard drive for funds that finally resulted in the purchase of the estate from John Augustine Washington, Jr., a great-grandnephew of the General, in 1858.

Those who have been to Mount Vernon prior to 1949 may protest: "But I distinctly remember a greenhouse when I was there! In fact, I bought the boxwood and the ivy you now see growing in my own yard in what they said was the greenhouse, right beside Martha Washington's flower garden!"

Right, but that was the *utilitarian* greenhouse, built in 1869. It was erected on the site of the original

Washington greenhouse, which burned to the ground one bitter cold morning in December, 1835, and, while it was not exactly an eyesore, this interim replacement obviously clashed with authentic 18th Century structures around it.

The new building is as nearly like the greenhouse planned and built by Washington as painstaking research, plus some actual archeological work, can make it. The story of its restoration reads a little like a detective mystery, with many gaps in the "evidence" that had to be pieced together from conflicting testimony and the barest of clues. The voluminous writings of Washington himself, and the detailed reports he required of all who worked for him, were extremely helpful. An insurance policy, filed in Richmond, played a major role!

Mount Vernon, in 1773, three years before the out-

tary aide, in August, 1784, asking his assistance in obtaining dimensions and other data relating to Mrs. Charles Carroll's greenhouse at Georgia Plantation (now Mt. Clare), near Baltimore. The new greenhouse took form slowly; another document reveals that the roof frame was not raised until May 18, 1787. General Washington was then in Philadelphia, and the storekeeper's charge for a special ration of rum to the men who raised the framing added that it was issued "by Mrs. Washington's order."

Again we do not know the exact completion date. Wings were added to the central building, for use as servants' quarters, and these were finished in 1794.

Both in function and design the early American greenhouse differed quite a bit from the modern greenhouse. Plantation owners and other wealthy landed gentry did not consider their estates complete without



Modern realtors would have you think that radiant heating is a recent invention. But General Washington knew about it, and used a system of flues under the floor to warm his greenhouse without damaging the plants from smoke. The sunken fireplace, right, provided warm air that circulated under the floor and up through the walls of the conservatory. The fireplace at the left provided heat for the fireman and for the gardener's office on the floor above.

break of the Revolution, consisted of a rather modest house, with none of the auxiliary buildings, lawns, groves and formal gardens. In 1773 George Washington sent his London agent an order for window glass, paint and hardware, stating he wanted to make some repairs and alterations in his house. At the same time he engaged a master builder, and had him outline the materials that would be needed in an ambitious program of building and landscaping. This was hardly started before the call of duty took Washington away from Mount Vernon in the spring of 1775, not to return for nine years.

Meanwhile Lund Washington, kinsman and manager, continued the development of the estate, completing the additions to the Mansion, erecting the present buildings about the courtyard, and extending the formal gardens. With the return of the master in 1783, one of his first proposals was the erection of a greenhouse, along the north side of the flower garden.

The exact starting date is not known, but there is a letter to Tench Tilghman, Washington's former mili-

an ornate building to shelter a collection of "exotic" (tropical or non-hardy) plants and trees. These greenhouses were showplaces, and topics for after-dinner conversations.

Like others of its period, Washington's greenhouse was sturdily built of brick, with a hipped and completely shingled roof. Along the south side seven tall windows, with double-hung sash, allowed the warm sun to pour in heat and life-giving light a good part of the day. These windows have shutters, too, but on the inside. These were closed during periods of extreme cold, and sometimes straw was stuffed between them and the windows to provide further insulation.

Modern realtors would have you think that radiant heating is something new. Washington used a modified form of radiant heating in his greenhouse by running flues beneath the floor and within the side walls. A solid masonry wall separated the back, or north half, of the central building from the room where the plants were kept. Here in back was a firepit, in addition to a regular fireplace. During cold weather a servant fed

logs into these at regular intervals, and flues carried warm air and smoke on a circuitous course under the floor and around the greenhouse walls before discharging from one of the two tall, brick chimneys. Thus no smoke could mar delicate plants.

Because the greenhouse was essentially a showplace, and not a place to start plants for transplanting, everything was kept in easily movable boxes, tubs or pots. The larger trees—orange, lemon, lime, etc.—sat on the floor directly in front of the windows; the smaller plants ranged upward on benches, or tiers, which rose, one behind the other, like a small amphitheater. Most plants were moved outdoors between June and September.

Washington's collection began with a few plants

by crumbling ruins of the once beautiful building. Then a utilitarian greenhouse was built, and, later, living quarters for visiting Regents were added. At that time limited funds and lack of data would have prevented faithful reconstruction of the original.

But the Association realized that the substitute building was out of key, and should be replaced with a truly authentic structure as soon as possible.

Washington was a meticulous business man, as well as a soldier and statesman. But, oddly enough, he does not seem to have lavished the same amount of time and study on the greenhouse as he did on other parts of the plantation. At any rate, not much evidence of his personal attention has come down to us, and some of the items are contradictory. Three rough

Interior view of the reconstructed conservatory, filled with non-hardy plants mentioned in Washington's papers, or in accounts left by visitors to Mt. Vernon. The tubs and pots before the windows contain lemon, lime and orange trees. The sago palm, upper left, is a scion of the original plant once at Mount Vernon. An original watering pot owned by Washington stands on the far shelf, with other 18th Century garden equipment.



offered to him by his old friend, Carroll. These included shaddock, orange, lemon, limes, aloes, and some scented shrubs. Seeds, bulbs and plants, gifts from admirers all over the world, soon enlarged the greenhouse show. Washington also ordered sizable shipments of plants, some from as far away as the East Indies.

At the time of his death, in 1799, Washington's greenhouse collection, while not the largest, certainly compared well in variety and oddities with the best private collections anywhere.

Then came the fatal night in 1835, when a bitter cold wave swept the East. New York was devastated by a disastrous fire that is remembered as one of the city's great catastrophes. At Mount Vernon a servant must have put one log too many into the firepit, overheating the flues, and the whole greenhouse and servants' wings went up in flames. Of Washington's priceless collection only a lemon tree and a sago palm survived.

For more than forty years the site was marked only

alternate study plans, drawn by Washington, have survived. Fortunately the information Tilghman procured about Mrs. Carroll's greenhouse is in the Washington Papers at the Library of Congress. Also there is a sketch drawn by Benson Lossing for his "Mount Vernon and Its Associations" (1859), showing the ruins as they appeared in the last days of private ownership.

Sufficient data had been gathered by the late 1930s, but World War II forced a postponement of the project. In a way this was fortunate, because none of the research had disclosed just what the all-important south front of the building looked like in its entirety. Bushrod Washington had taken out a fire insurance policy on the buildings of the estate in 1805. A rough ink drawing of the greenhouse was found with this policy in the files of the Mutual Assurance Company of Richmond in 1905.

When a member of the research staff asked the insurance company for a larger print of the drawing, a clerk in the office suggested he might be interested in the policy for "Mount Vermont," drawn up in 1803, and

quite similar to "Mount Vernon." It quickly developed that "Vermont" was a typographical error, and from the 1803 plan the architect was able to locate the windows and other details of the wings used for servant quarters.

Although exploratory excavations were made in 1941, it was necessary to demolish all buildings on the site before the original foundations could be uncovered, and certain conflicts in the various plans and sketches resolved. So, in 1949, the site was levelled.

As the walls were peeled down it was found that the first reconstruction had used original wall footings, and had conformed to the ground dimensions of the original structure. It was also discovered that the floor area within the greenhouse proper had at one time been excavated to a depth of several feet and refilled. Although this operation had obliterated the flues used for heating, it indicated their general location, and the flues could be duplicated from the plans of the Carroll greenhouse.

The lower three or four feet of the south wall of the west quarter were obviously of early origin. Yet the jointing of the interior of this section of old wall was found to be beaded and grooved. These are characteristics usually found on exterior brick work. Here was a puzzler, until it became apparent that this was a section of the original garden wall, completed in 1775, and it had been incorporated into the building.

There were other mysteries, which had to be cleared up before the reconstruction could proceed. Dimensions mentioned in Washington's correspondence did not jibe with actual foundation dimensions. There was also an unexplained three-year lull in the original building operations.

Then an odd scar was noticed in the foundation about four feet from the southwest corner of the greenhouse. The wall continued straight enough, but one could see that it had not been built in one operation. A phrase in one of Washington's letters gave the clue—"he feared he had planned his Greenhouse on too contracted a scale." Hence the delay, to draw up more ambitious plans, and hence the continuation of the walls at a different period.

Perhaps the most interesting finds made by the "archeologists" resulted from screening the fill beneath the greenhouse floor. One item was a cut stone keystone, which logically belongs nowhere else but at the top of the arch of the central window, as shown in the insurance company sketch of 1805. Also found were enough fragments to reconstruct an 18th Century

flower pot. The keystone is now back in place in the reconstructed greenhouse and reproductions of the flower pot are being used to contain plants displayed there.

A passing reference in one of Washington's letters to his manager identifies one of the small rooms at the rear of the greenhouse as a shoemaker's shop, so a completely equipped cobbler's shop has been set up there—another of the small industries that made Mount Vernon an almost self-sufficient unit in its heyday.

After all the plans and specifications of the new greenhouse had been worked out, there was still the problem of materials. Hand-made brick today is hard to find. By a happy coincidence, however, the White House was then being rebuilt, and thousands of 18th Century handmade brick replaced by concrete and steel. With the ready cooperation of the Commission on Renovation of the Executive Mansion,

bricks from the White House were made available to the staff of Mount Vernon. So Mount Vernon and the White House at last have a bond in common, although Washington is the only President who never lived under the latter's roof.

Because the greenhouse, to be authentic, required a shingle roof, the cooperation of two modern commercial organizations was sought and obtained. A Virginia lumber company revived a handicraft, now almost lost, to duplicate the hand-rived cypress shingles that Washington procured from the Tidewater country, and a Pittsburgh concern treated the shingles so that they are immune to decay and insect damage.

In addition to the restored cobbler's shop, the new greenhouse also contains the small office of the Mount Vernon horticulturist, Mr. Robert B. Fisher. This is not an exhibit area. A narrow stairway leads to the second floor room where, in addition to modern records and planting charts, Mr. Fisher keeps a fine collection of books on 18th Century gardening.

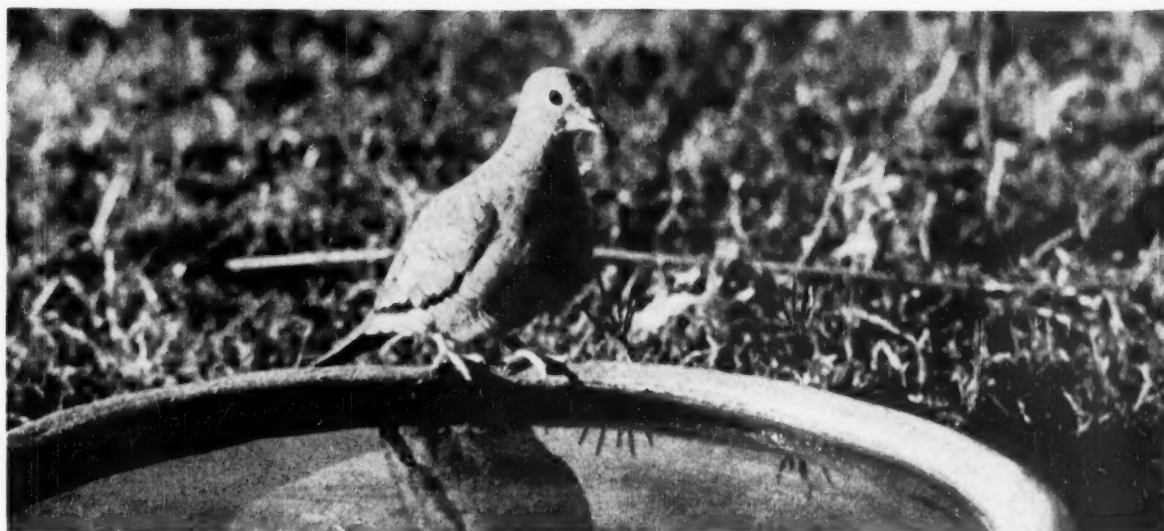
So again the tropics have come to Mount Vernon. The writings of Washington, his gardeners and managers, and letters of visitors have been studied to determine just what plants and trees actually flourished there. Thus far a total of thirty-four have been found, and through the help of nurseries in Florida and elsewhere, have been placed in the greenhouse.

But pride and favorite of the Mount Vernon horticultural staff are two sago palms, both scions of the original plant selected by General Washington, and which survived the fire of 1835—a living link with the First President's love of the "exotics"!

WASHINGTON'S PLANTS

The following are the common names that research has proved to have been used by Washington or his gardeners. Some plants, such as "Rose of China," will be recognized by southern visitors as the "Hibiscus."

Opopanax or Cassie; Huisache; Aloe, Ala, Century Plant; Belladonna Lily; White Pellitory, Paris Daisy; Lime tree; Sower (sour) or Seville Orange; Shaddock; Lemon tree; Mandarin Orange; Coffee; Jade Plant; Sago Palm, Fern Palm; Persian Cyclamen; Loquat; Tropical Fig; Fuchsia; Cape Jasmine; Rose of China; Turnsole; Lantana; Mango; Myrtle; Oleander, Rose Bay; Olive Tree; Lemon-scented Geranium; Rose Geranium; Nutmeg Geranium; Ivy-Leaved Geranium; Avocado; Pomegranate; Jerusalem Cherry; Laurestinus.



The Inca dove is a diminutive, tannish-gray bird with an eye-taking maroon of wing that is seen only when the dove is preening or in flight. Its eye appears to be a dark red.

Inca Princess with Wings

By EDNA L. RUTH

Photographs by Harry L. and Ruth Crockett

"DID YOU see the tiny dove I just flushed?" my sister called excitedly, early that mild autumn morning. "I'm sure I caught a flash of reddish-brown when it flew to the lower trees. And there wasn't any whistling of the wings as when a mourning dove flies." The diminutive, tannish-gray dove she had glimpsed in bounding flight, proved, when seen again, to be quaintly scaled, with an eye-taking maroon of wing that is seen only when preening or in flight. Even the feathers of the small head had the shelly look of tiny scallops. The color of the eye, although difficult to see, appeared dark red. Here in central Kansas we occasionally see unusual birds, but an Inca dove a resident in our back yard in November was a real record.

From South America the Inca dove extends its range northward to Nicaragua, Honduras, Guatemala and Mexico. Its distribution in southern Texas, southern and southwestern Arizona and southwestern New Mexico, however, is extremely local. Although there has been some extension of range, especially in Texas, *Scardafella inca* has been considered non-migratory. But here it was in Kansas!

As the displaced person arouses our sympathy, so did this dainty feathered creature become our chief interest and concern in the seventy-two days that followed. As the sexes look the same, we fell into the habit of speaking of our exquisite guest in the feminine gender. None too originally, we called her "Inky." If we chose the Biblical basis to justify our arbitrary

decision as to sex, the dove of Noah's Ark is spoken of in the feminine gender four times, in the neuter only twice.

Quickly Inky fell into a routine that deviated but slightly. Three nights she roosted beside the bird-bath in the big snowball bush. This was dropping its leaves, so she habitually slept ten or twelve feet up in the east half of our only cedar, which abutted the sidewalk on the southern edge of our yard. On cold nights she moved closer to the bole of the cedar. Bedtime varied from 3:25 to 4:40 p.m. Once she was about until six. Between 7:50 and 8:30 in the morning the bird came around to the rear of the house for an early handout. As the Inca dove is semi-terrestrial, we scattered kaffir corn or mixed chopped grains under the central feeder. From our dinette window, her short legs were not visible as she trundled about on pretty flesh-colored feet that peeped out from her soft gray petticoats, which barely cleared the ground. If one ignored the long, white-edged tail, her scalloped back resembled the carapace of some strange new turtle. Sometimes tucking down her head, she would scuttle toward the thieving sparrows in a shrewish manner. When perched, the long tail, hanging straight down, could easily be mistaken for a dry twig in the bush, and she for a sparrow, until the lighter breast could be seen. That so delightful a creature should ever have been unprotected by law seems incredible, but in times past it was shot, in and out of season. However the Inca dove is now given full protection, for it is not listed



A young Inca dove on the nest, which is a rather casual structure, often used for a succession of broods and over a period of years.

which is short-tailed, the Inca is the smallest, being only eight inches long. In her breeding range, the Inca dove now prefers living close to habitation of man, and the Inca is not averse to feeding with the barnyard poultry. Few instances have been noted of these doves breeding in the brush.

The Inca dove seemingly breeds the year around. Courtship, during which the tail is

in any State as a game bird, and should never be.

That Inky came from sunny climes was evident from her somnolent pleasure in the rite of sun worship. She adopted as a sunning board a broad old board at the end of the curving garden path. Second choice were two bits of shingle placed in front of the snowball bush. One wing, then the other, would be raised in mystic supplication, but with the elegance of a southern belle coquettishly using her fan. The dove's soft, light-gray breast, with its fluted, crinkled appearance and pinkish glow, received her attention, too, but she most enjoyed the ostentatious combing of the handsome, square-cut, dusky tail. At times the lovely, colorful wing was raised on guard, at right angles to the body, in protest at the nearness of a sparrow. This use of the wing, and a growling note, are said to introduce bloody combat between the pugnacious males during courtship.

Just beyond the northern edge of our grounds stands a grain elevator. Except for early breakfast, this was Inky's place to find small waste grains. Before eleven, and again during the afternoon, usually from her sunning board, she took off. Flying seven or eight feet above the ground, she angled the area to alight some eighteen feet up in the corner mulberry tree, which became her landing field to and from the elevator. There, bobbing her head, she pattered about until she was full, or was disturbed by trucks approaching with grain. After the last feeding the bird's day ended with another sunning and a long drink. And so to bed.

Exotic Inky was with us quite a while before we heard her rather coarse voice in the characteristic "coah coo," guttural in comparison with the mellow fluting of the mourning dove. This call came usually just at dawn, although several times we heard it during the night.

Of the nine species of pigeons or doves cited by Peterson as occurring in North America, *Scardafella inca* is the most beautiful. Except for the ground dove,

vertical and fanned and there is much strutting and cooing, begins in February. And surely no later nesting date could be found than was reported when a nest with two young was found on December 26, 1951, at Rockport, Texas.

Simple nests are built in various cactuses, fruit and shade trees. The female places the sticks brought by the male. Frequently old nests of cactus wrens and other birds are accepted. More often, a nest, once built, is refurbished and may be used for several years. The dove can almost be petted while incubating, often allowing one to approach closer than arm's length before leaving the nest. The two smooth, white eggs have little gloss and are said to be smaller than the eggs of any other dove. Incubation is shared by both parents and is close to fourteen days, with the young usually remaining an additional twelve days in the nest. Although the parents often begin preparing the nest the following day for the next clutch, they do roost two or three nights, the fledglings flanked closely by the parents. The young birds are similar to the adults in plumage, although paler and less wine-colored. Soon after full size is attained the post-juvinal molt takes place. The feeding of the young of all doves or pigeons is at first by regurgitation of pre-digested food. The young, usually one on either side of the parent, insert the bill into the mouth of the parent, whereupon a vigorous bowing or pumping, with spasmodic jerking of wing and body, takes place. Although often several attempts at incubation are frustrated, four or five broods a year are known to be common. After the height of the breeding season, the doves often gather in little flocks numbering up to fifty.

Our Inky must have been lonely with no others of her kind about. Although a wide range of temperature is borne by the Inca dove while incubating, such low temperatures as befell our guest twice in December, and again in mid-January, were not easily endured. Be-

Even the feathers on the small head of the Inca dove have the shelly look of tiny scallops.

wildered by the snow, buffeted by the wind, poor sun-loving Inky was driven from her three-foot-high perch in her bush. She took refuge in a niche of the east door of our tool shed. Then she was seen on the ground, hoping to find the wind somewhat tempered by the building. After this, she sat low in the bridalwreath bush, protected by the neighbor's garage, or low in the japonica down the garden path. As the storm abated, she chose an old, bent-over, giant sunflower stalk and huddled there, some six inches off the ground. This white stalk became her best perching place. Coming in for early feeding, the dove sometimes sat on a thin pole that we ran through the braces of the well

roof. She missed the drinking water, and skidded miserably on the ice. She did not recognize or accept snow in lieu of water, as many birds do. During these unhappy days, Inky ate little and preened not at all. When the weather warmed she resumed her old manner of sunning and preening. By December 28 she drew her left foot up, cramp-like, one toe showing white and broad. Later the other foot also seemed somewhat frosted. Perhaps they were more tender because of some goo she had gotten into, for she had surprised us by landing on the well coping in little black shoes instead of her customary pink feet.

During a fine stretch of weather in mid-January, we draped the large stepladder with canvas and three times tried to take a picture of our rare dove. With proper equipment and experience the first try should have been successful, for she came to eat the grain I had scattered on her sunning board. But movement in the blind startled her and she would never again linger near the awesome contraption.

On January 20 we had seen Inky go to bed at 3:45 p.m. The following day passed much as usual. Later in the afternoon she sat on the leaf mulch in the berry rows, as she so often did after the three severe spells of



weather. She was seen to come for a drink at 3:35 p.m. and again returned to this spot, although there was no sun. We missed her at 4 p.m., and thought she had retired to her cedar. She did not come to early feeding the next morning, yet we were not too uneasy until mid-afternoon. By evening we knew we had lost our charming Inky. Whether she fell prey to one of the many stray cats constantly about, or whether we drove her away with our attempts at photography, is an unsolved riddle. Although we searched, we found not so much as a wing. Her sudden appearance in November remains just as much of a mystery. Perhaps the most logical explanation is that suggested by a friend when looking over the haunts of Inky: "You know, I bet Inky came in from the West on the Main Line Santa Fe in an empty grain car and escaped when the freight train stopped at the grain elevator. Why wouldn't she stay on the grounds of those who proved friendly, when she so easily found food and water?"

Sometimes, in fancy, we still seem to see her, with royal dignity gracefully lifting her gorgeous maroon-trimmed wings in quick flight. And we marvel that we had not realized all along that we had entertained, not a mere bird, but an Inca princess in dove disguise.

Conversation Pieces

The small burnt matches that I see
In tulip cups, look odd to me.

By JANE MERCHANT

Nature's a woman, there's no doubt,
To set such fancy ashtrays out.

Supper for *Drosophila*

By HOPE SATTERTHWAITE JEX

Illustrated by Garnet Jex



SUNDAY evening. I relaxed at the living room desk with the traditional narcotic of the Sunday newspaper. My human partner was drowsing on the couch, his comfort shared by two of the feline members of the household. The third preferred the seclusion of an easy chair. The radio furnished gentle background music. I felt replete with the housewifely virtue of having cooked a good dinner, washed the last pan and put the last dish in its place on the pantry shelf.

And then *Drosophila* joined me. First the little fruit fly flitted around the bridge lamp that lit the desk. He explored the warm interior of the shade, disappearing within its glowing cavern. But, finding nothing there to his liking, he soon came out and dropped to the newspaper on the desk. He paused, waved his antennae and took stock of his surroundings. Before him stretched unknown territory. He set out to explore it. Somewhere on the vast expanse of black and white might lurk the supper he sought.

To watch him at closer range I quietly opened the desk drawer and took out a magnifying glass. So far removed from mine was his world that I found I could follow him with the glass held near him, yet not disturb him at all.

He seemed most systematic in his search. He would stand quite still for an instant, waving his antennae inquiringly. Then he would choose a direction and set out across the paper in a rapid beeline. A few inches beyond, he would pause, again take stock with waving antennae and head in a new direction. But nowhere could he find the food he wanted.

I decided to come to his assistance. After all, we, ourselves, were drowsy with Sunday dinner. Why not extend our hospitality to this self-invited little guest? I remembered that his brothers at the Crocker Laboratory of Columbia University, bred to test the effect of X-rays on the genes, had delighted in the fermenting sugar of over-ripe bananas. Perhaps the family sugar

bowl could supply the needs of this diminutive guest.

I put a pinch of sugar on the newspaper and gently steered him to it with the tip of a finger. His immediate change of manner amazed me. Whereas, before, his search had been patiently dogged, he now grew greatly excited. His antennae, which had previously waved gently in the air, were now bent down in a graceful, purposeful arc until they probed among the sugar granules. He ran in short, constantly turning jerks back and forth through the tiny heap of sweetness, stopping continually and prodding fiercely at the sugar.

But it seemed to me, as I held the glass close above him, that he was not really eating, interested though he was in the idea of food. I then remembered having read of his fondness for sweetish fermented liquids,

such as beer, wine and cider. Also, the fermenting sugar of the bananas might be less impenetrable than the unfermented (as I believed and fervently hoped) variety from our bowl. After all, his very name, *Drosophila*, meant lover of dew or moisture. Accordingly, I put a drop of water on the pinch of sugar and spread it into a thin paste.

My deduction was correct. At last he had a supper he could eat.

Here again his manner changed. On the dry sugar his antennae had curved down and prodded seekingly. But, once they found the moistened mixture, they straightened out placidly into space and he sank his little mouth delightedly into the almost liquid paste. He quaffed long draughts, moving his tiny head up and down with the precision of a not-too-rapid metronome. Slowly, with quiet satisfaction, he progressed across the sweetened paste, sipping copious helpings, then moving a few steps to try another spot.

Every so often he would make a mistake and wander to the expanse of paper beyond the limits of the sugar. Aghast, he would stop. Where had his supper vanished? A frantic search would follow, a search differing utterly from that made across the paper when he first alighted on it before running into treasure trove. No gently waving antennae this time, but prodding, seeking arcs. The previous search had been merely a hopeful quest for the Golden Fleece. This was an anguished attempt to reenter a lost, remembered Eden. Thanks to the guiding fingertip of his *dea ex machina*, this particular Eden was more easily revisited than are the majority of those envisioned by human cerebral convolutions. I would head him back in the right direction and he would resume his interrupted feast.

But, like the rest of us, even (Continued on page 442)





PHOTOGRAPH BY ROAHEN

Valiant was the star, the personality among the thousands of anonymous elk that fed near the author's Jackson Hole home in winter time.

Valiant, Bugler of the Butte

By GRACE SHARRITT NELSON

THE bull elk walked slowly down the slope from the high, timbered ridge. His course lay across the snow-crueted field towards the swamp, away from the wintry wind. Once he stopped, lifted his antlered head in the challenging pose of the arrogant male elk. Then—as with a sigh—he lowered his noble crest, stumbled on across the slough into the dimming December twilight.

It was Valiant—I felt sure; the Valiant I had known so long. He was older, slower, perhaps humbler—but Valiant!

To me, Valiant was not just any one of the hundreds of elk bulls that migrated each autumn into our fields on the National Elk Refuge at Jackson Hole, Wyoming. Valiant was the star, the personality among the thousands of anonymous animals that fed near our house in the wintertime.

This elk owned the most gorgeous set of antlers; stood above all the others on the feeding grounds. He was the one who would lock horns with any bull, always coming off the victor. How often the sounds of the clanking antlers would divert me on a winter day! How often I would step outdoors in early March, when the bulls were shedding their antlers, to watch Valiant scratch, or loosen, his horns against another's!

I watched, now, from the window of our house, which faces the field, the swamp, and the long trails into the distant Pass of the Yellowstone. I watched the handsome old fellow turn the butte, and then vanish out of sight. There was something in his bearing, some intangible quality that set him apart from all others.

He was an old friend, and seeing him brought memories of the Valiant of earlier years.

There was the picture of his infancy, as a wobbly legged calf, nuzzling his mother in a June mountain meadow of blue lupine and spicy sage. There were memories of his adventurous, lusty life as an upstart spike, brashly ready to fight any male elk twice his size. Valiant was one only to be quelled by force, not fear.

As I threw a log on the hearth, brightening the warm, cosy room in sudden shafts of light, there was a specially vivid picture of Valiant as the bold, handsome Lothario I liked best to remember. To me Valiant was the magnificent symbol of the male elk of the largest elk herd in the world, in the valley of the Teton Mountains at Jackson Hole, Wyoming.

Valiant's bugle notes in the September rutting season set him above all rivals, for he sounded the clearest, the sweetest bugle music in the valley. Its resonant tone carried the farthest across the sagebrush, over the river bottoms, into the secret groves along the ancient elk-trails. His bugle was the clarion call, echoing and re-echoing above Poverty Flat, bouncing along the ridge that held up the mountains in the purple twilight.

Always when I heard Valiant's bugle notes in the fall, I knew a particular happiness. I knew that once more this beautiful animal had escaped the hunters' guns.

"That's Valiant," I would say jubilantly to my husband, as we watched the long line of elk coming across the Flat in the autumn dusk. "There's no other



PHOTOGRAPH BY ALMER P. NELSON

A winter scene in the National Elk Refuge at Jackson Hole, Wyoming, to which the animals migrate in winter from the high, back country where they summer.

bugling like his!"

"How can you be so sure?" he would often ask.

"This bugling sounds like all bulls in the prime of life."

I would smile to myself in the gathering dusk, hearing again, and again, the high clarion notes, ending in the series of guttural, staccato grunts.

"The most beautiful sound is always that of Valiant. Surely you can't ever forget our introduction to Valiant's bugle?" I would say. "Surely, you remember that exquisite October afternoon when we hid among the brush on Romey's Butte and heard Valiant for the first time?"

My husband remembered, of course. Who could ever forget such an experience? But he liked me to retell the story. We both reveled in tales of our Wyoming wilderness. We both loved the wild sounds of all animals, the raw scents of sage and dung, the long distances and silences of our western country, broken only by these wilderness calls and earth-perfumes borne on western winds.

And so I remembered Valiant's first bugling, as I threw another log on the embers, and drew the curtains on the night. My heart was warmed by the memory of that first adventure, when Valiant was young with the boundless vigor of living.

It was the second day of October, an October so beautifully poignant that it caught at one's throat. Yet it was an autumn so brief, that each day was made precious by the fear that it would be gone before the dawn of the next morning. Daybreak might find drifts of snow, swirling ground blizzards, or thick

curtains of frost and fog, foretaste of the winter that soon would claim Jackson Hole.

So that October we enjoyed each hour to its fullest. We explored the canyons in the exhilarating air. We drove across open range country, pushing always to the tops of ridges, buttes, and hills so that we could look down over one of the last majestic frontiers of North America.

October in Jackson Hole, is unlike anywhere else, because it is the season when thousands of elk begin coming into the valley from their summering ranges in the northern Wyoming high country. Nowhere else can one watch and marvel at the long lines of the animals wandering in under cover of autumn twilights. They are migrating to what will be their wintering quarters until spring, when they will return to the high, back country to calve, and find retreat from man's civilization.

This day, made memorable by our introduction to Valiant's bugling, was warm, with a light caress of breeze. As we journeyed across the Flat, occasionally we would stop and swing our arms wide and breathe in great gulps of the wonderful fragrances of sun-baked earth and drying sagebrush. Again we would stop as our course took us nearer the river, and count the flocks of Canada geese going over. And always we searched the ground for signs of animals. There, a moose had trod across the trail and into the willow bottom. Here, a bear had ambled, taking the slope into a patch of pines and huckleberries. But it was the fresh signs of elk tracks for which we searched. "Had

the migration started from the high country?" we wondered. "How many elk were in the Hole?" we asked. That was our mission that Indian summer afternoon.

As we drove across the roadless sagebrush, flocks of deep-indigo mountain bluebirds acted as guides to our destination, an aspen grove concealed in a great curve of the Snake River. Once we flushed a pair of ruffed grouse, which startled us as much as we did them. Now the country was wilder, more isolated than any we had yet traveled. It was silent with that kind of quiet that suggested that eyes were watching us from hidden cover.

We began to observe faint trails, too, paralleling our path. I had the strange feeling that we, like the early frontiersmen who had long gone before us in this lonely valley, should be on our guard.

"From what?" my husband would laugh. "This is the safest place in the world. The wolves are gone. Mountain lions haven't been seen for years. Even a grizzly will get out of your way, if you give him half a chance."

Nevertheless, my spine would prickle at every bounce of the jeep. My heart would jump at every mysterious move in the willows at the left.

Then we stopped, turned off the motor, and listened. A red-tailed hawk in the sky shrilled its wild "keee-rr" cry. And then I heard the beautiful ascending notes of a bull elk in the distant grove. The elk bugled again; then again; a high baritone climaxed with deep, bass-viol notes.

The bugle of any bull elk in his prime is worth hearing. No one can listen to this thrilling animal call in the high western country without a feeling of being close to the sublime, the primitive. But the notes we were hearing seemed to be distinguished from all others; to have a ringing resonance, a sweet bell-like quality. Perhaps it was the beauty of the day and the enchantment of the hour and place, but to me, this was never-to-be-forgotten music.

We looked at each other, without speaking. Had the bull heard us? The copper-leaved aspen grove bordered a bald-faced butte, fringed with a top-knot of evergreens. How could we get to this top without disturbing the bugling elk in the aspens?



PHOTOGRAPH BY O. J. MURIE, U. S. FISH AND WILDLIFE SERVICE

The head of a two-year-old bull elk in the velvet.

Quietly, we circled the butte to its far side on foot, stepping lightly on rocks and earth, crouching often and listening for sounds of alarm. We belly-crawled up the knoll to the pines. A jay whistled a warning and we froze to the ground.

Then, gently easing ourselves to the edge of the butte, we gazed upon a remarkable scene. In the distance wound the river, a sash of blue twisted into the greens and browns of a panoramic basket. Above, and infinitely out of reach, the incredible peaks of the Tetons made a gray silhouette against a bright sky. On this side of the river was a wide sand bar, then meadow, then grove.

Directly below us in the aspens stood a big bull elk, superb of carriage and with a handsome tawny coloring. His crown of seven-point antlers was lifted in a challenging, arrogant position. His watchful eyes were focused on the brush of pine where we hid.

Throughout the grove a band of cows and calves grazed. Several lay in the matted grasses, while a pair of cows, with keen movements, were alerted behind their sultan.

Suddenly the bull bugled. "I am the Lord and Master here," he seemed to say. "This grove is my

castle. These cows my harem, and mine alone. Take heed, any who may be passing. This is my land!"

Here was an elk in fine fettle, to be sure; a male animal who could make his boasting good, judging from his voice. Here was a personality that brooked no invader of his territory. Here was the King! Here was Valiant!

He bugled again, then lowered his head, beating the bushes around him with his antlers. This he continued to do in a sort of mock battle.

I was stretched flat on the ground, uncomfortable on a sharp rock. I moved carefully, but not quietly enough. Instantly the air was torn with a blast from the now thoroughly aroused animal as he started up the slope.

"What shall we do?" I whispered.

"Be still," my husband commanded.

The cows were frozen images. The calves stood close to their mothers. Valiant, with lowered head, moved upwards through the brush.

"Foolhardy," I thought. "Suppose we had a gun? Suppose we had come to kill!"

"I'm going to surprise him," my husband whispered.

Then he, who can bugle almost as well as any bull elk,

sounded off a challenge. The angry bull returned a scorching rebuttal. His tormentor rendered another worthy performance.

Valiant stamped up the steep slope, tumbling rocks and sand as he made the ascent. We could hear the cracking of brush. We could hear the sound of hooves.

Then he saw us! He stood perfectly still.

Scarcely daring to take a breath, we gazed at each other. What he felt, one could only guess. Was it chagrin, scorn, or fear of his ancient enemy, man? Then the elk turned and crashed through the brush in quick descent.

Humbled, we silently left the kingdom of Valiant to him and his. But in those moments he had given us something—an insight into the life of the wild that has been a cherished memory ever since.

Once at the foot of the butte, we looked back. An echo of a high bugle drifted clearly down to us like a brilliant afterglow of the autumn sunset. In the quickening dusk we moved hand in hand back to the trail, the bell-like sounds softly diminishing. They were the call of Valiant, the most beautiful bugler of the largest elk herd in the world.



Champion Lily

By NELL MURBARGER

IN SOUTHEASTERN Arizona, only a few hundred yards from the road to Chiricahua National Monument, stands this incredible specimen of narrow-leaved yucca, or palmilla, *Yucca elata*, thought to be the world's largest representative of its species. Measuring twenty-two feet in height, this giant member of the Lily Family towers nearly four times as high as its normal-sized brothers growing on the same upland flat, under identical conditions.

While botanists have advanced no definite reason for the unusual vigor shown by this particular specimen, it is noted that the plant has never set lateral branches, and, possibly, has never blossomed; thus leaving the entire growth effort to be poured into the central trunk. The age of the plant is not known.

Recognized by citizens of New Mexico as their State Flower, *Y. elata* is of widespread distribution from west Texas to southern Arizona, and into the Mexican states of Chihuahua and Sonora. Through much of this area the species often forms pure stands over hundreds of acres.

In its spine-tipped leaves, which have long been an important source of basketry material for Southwestern Indians, also lies great potential value as a commercial fiber crop. During both world wars, with our foreign sources of cordage material curtailed or threatened, leaf fibers from this yucca were processed and used in



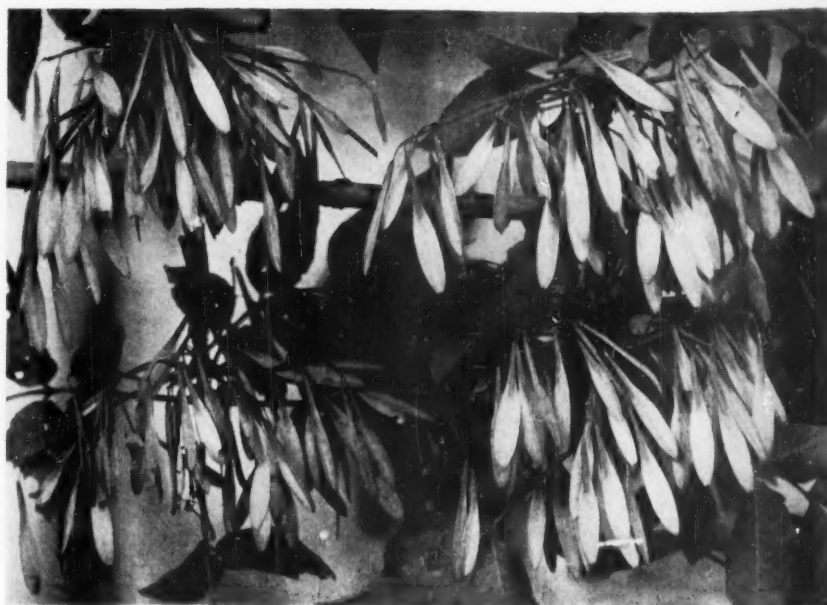
the manufacturing of rope, brushes, and like products.

As both roots and trunk of *Y. elata* are rich in saponin, Indians formerly valued the plant as a source of soap, a cross-section of fibrous branch providing not only a natural scrub-brush, but a built-in soap dispenser!

Do You Know the Tree Fruits?

A PICTURE QUIZ

Photographs by L. W. Brownell



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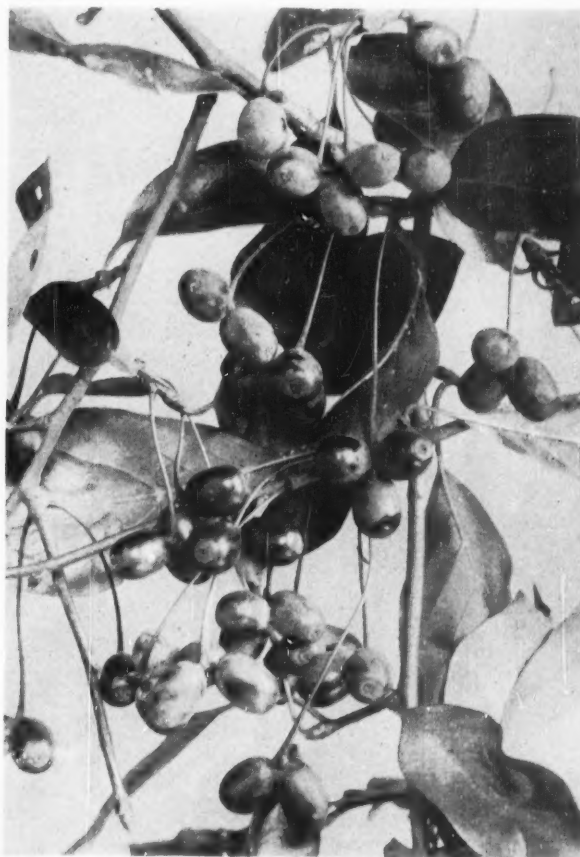
ONE of the most distinctive aids to the identification of trees is to be found in the form taken by its fruits, or seeds. In season, one who knows which is which needs scarcely to look at the tree to tell what it is. Study of these fruits is particularly interesting because of the widely varied appearance of the seed, or the capsule or fruit within which lurks the seed. On these

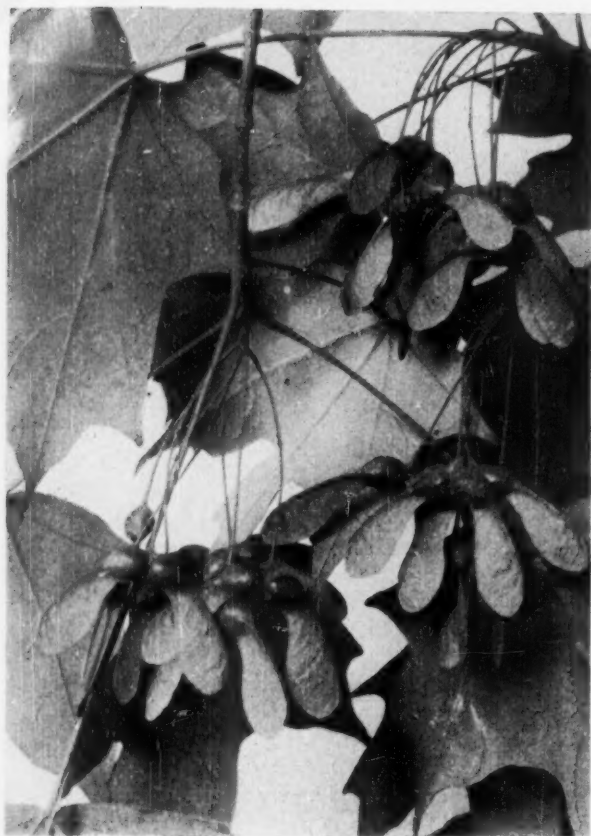
four pages are reproduced fifteen clear pictures of different tree fruits. If you can name all fifteen correctly you are really informed about trees. Ten out of fifteen would be a passing grade. If you know fewer you would find it worth while to do a little tree study. Try to identify these fruits by number, and then turn to page 442 and see how well you did in providing answers to this tree fruit quiz.

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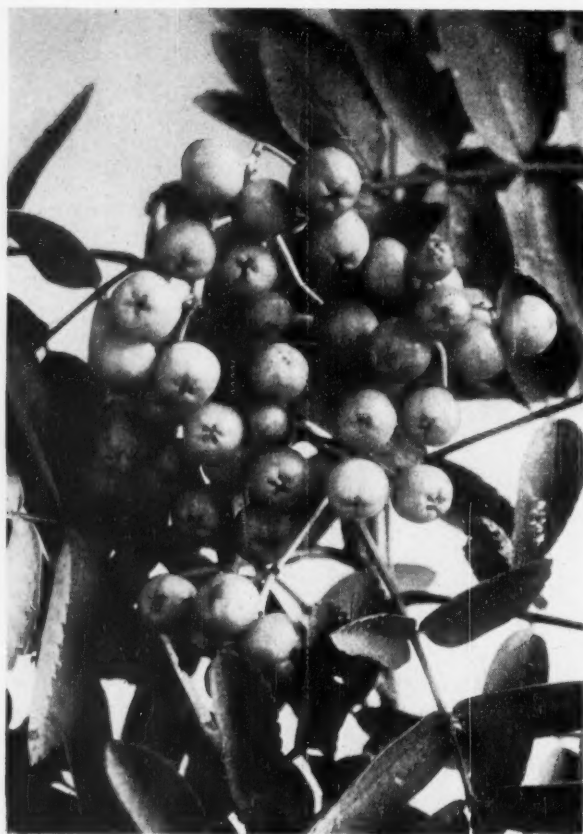


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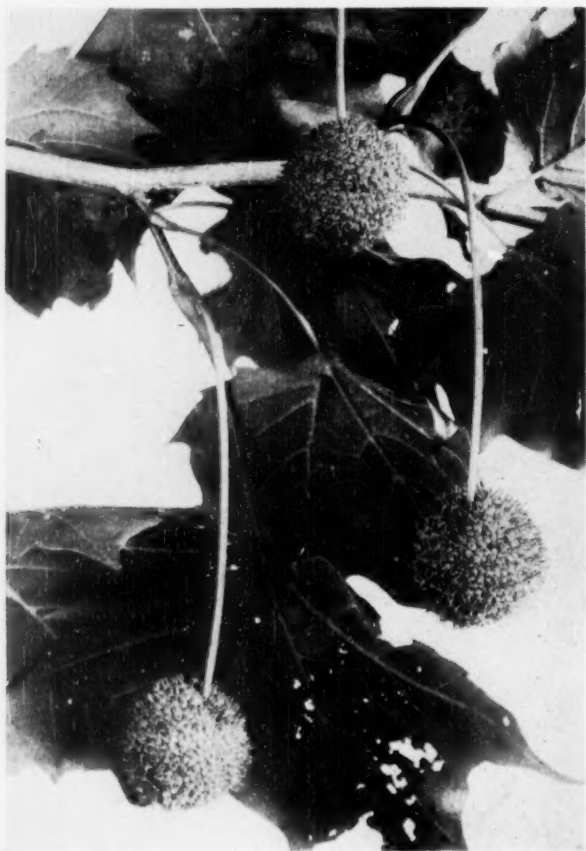




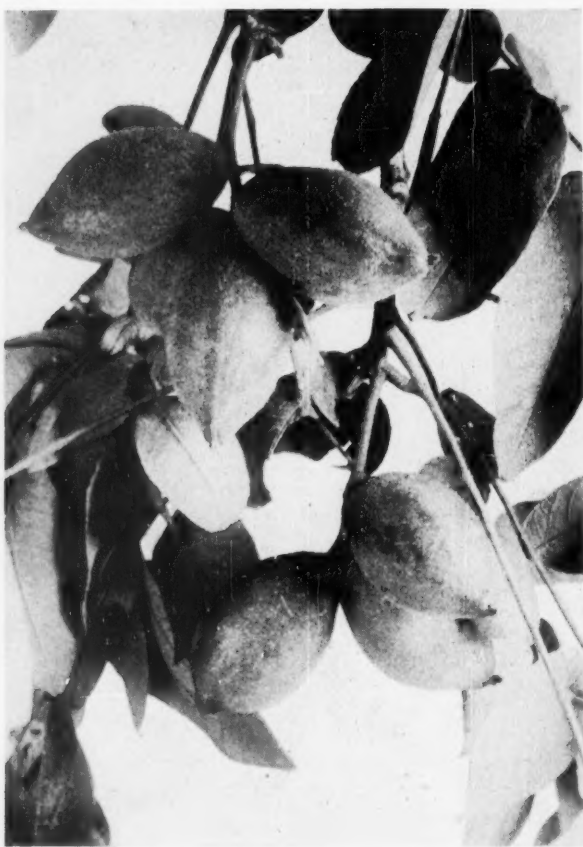
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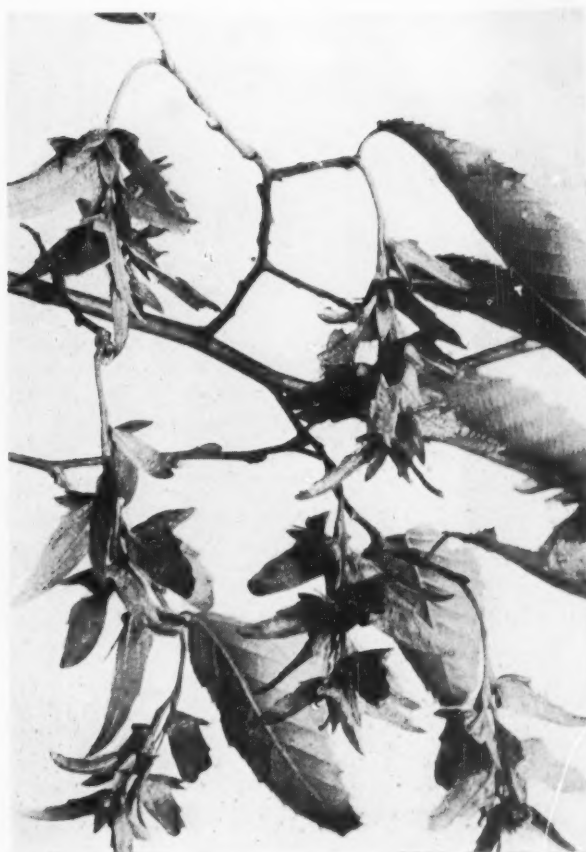


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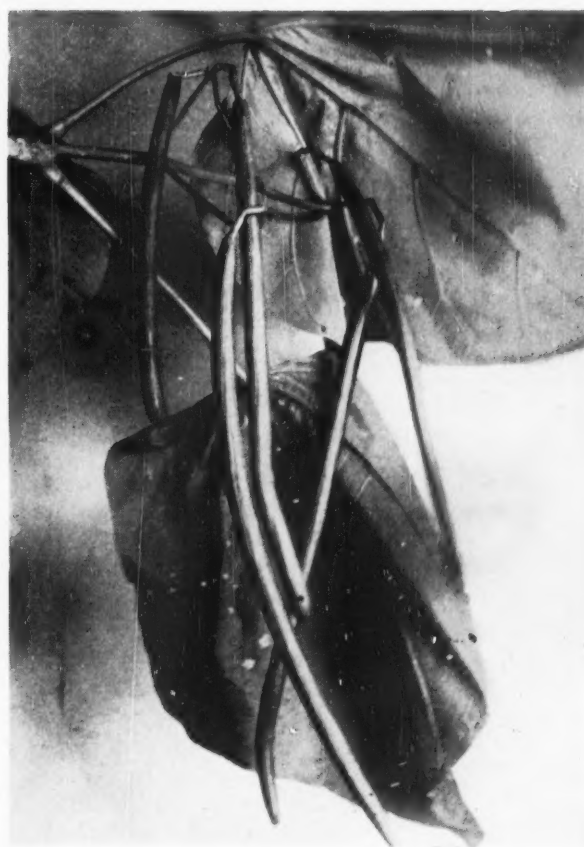
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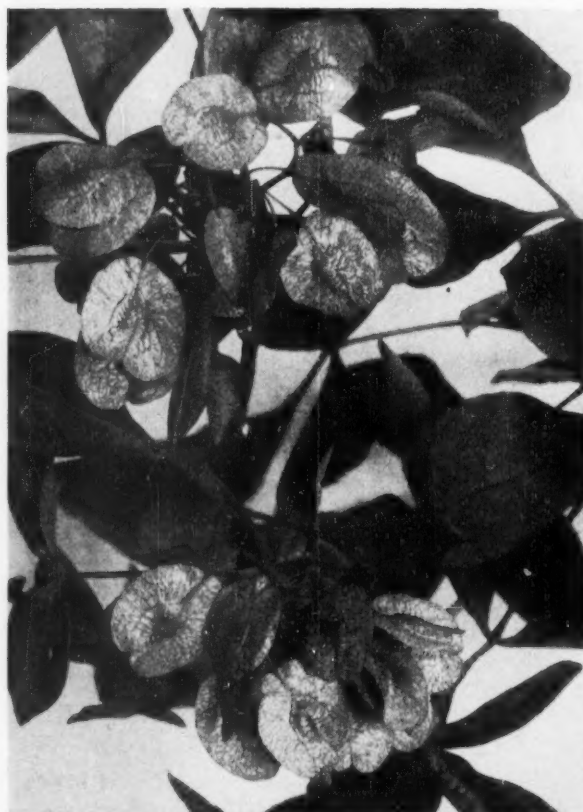


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Bird Portraits by Bounce-Light

By A. LANG BAILY and
WALKER VAN RIPER,

Denver Museum of Natural History

PERHAPS the most interesting and valuable recent development in photography is the high-speed electronic flash invented by Dr. Harold E. Edgerton of The Massachusetts Institute of Technology. This apparatus provides an extremely brilliant flash of light of very short duration. Its importance lies in the fact that it makes possible a wide variety of photographs that cannot be done in any other way. Examples of our work with this apparatus have ap-

At the right are a junco and a tree sparrow in the photographic box, and, below, two Gambel's white-crowned sparrows.





peared from time to time in *Nature Magazine*—"The Toad and its Tongue," May, 1947; "Homing Hummer," August, 1947; "The Serpent's Tongue," January, 1949; "The Triangle Spider," December, 1951; and "Sugar for that Slim Girlish Figure," March, 1953. The pictures illustrating these articles were taken at exposures from 1/5000 to 1/30,000 of a second.

A recently developed technique in fashion photography is called "bounce-light." The set-up consists of a studio, the floor, ceiling, and walls of which are painted a glossy white. Two or more high-speed flashes are used and these are directed at the ceiling, not at the subject, so that their light bounces from ceiling, floor, and walls in such a way as to illuminate the subject with an evenly diffused, almost shadowless, lighting. This method produces some interesting and beautiful results, both in black and white and in color.

Our studio for making bird portraits by bounce-light consists of a packing case lined with glossy white, shelf paper, with a flash at each side directed at the ceiling,

The red-shafted flicker, at the left, and a house finch photographed on the wing.





At the left a house finch takes to its wings and, above, it lands. Below is a fine, sharp portrait of a pink-sided junco taken by the bounce-light technique, which almost completely eliminates shadow and makes possible outstanding photographs of birds, and other subjects.





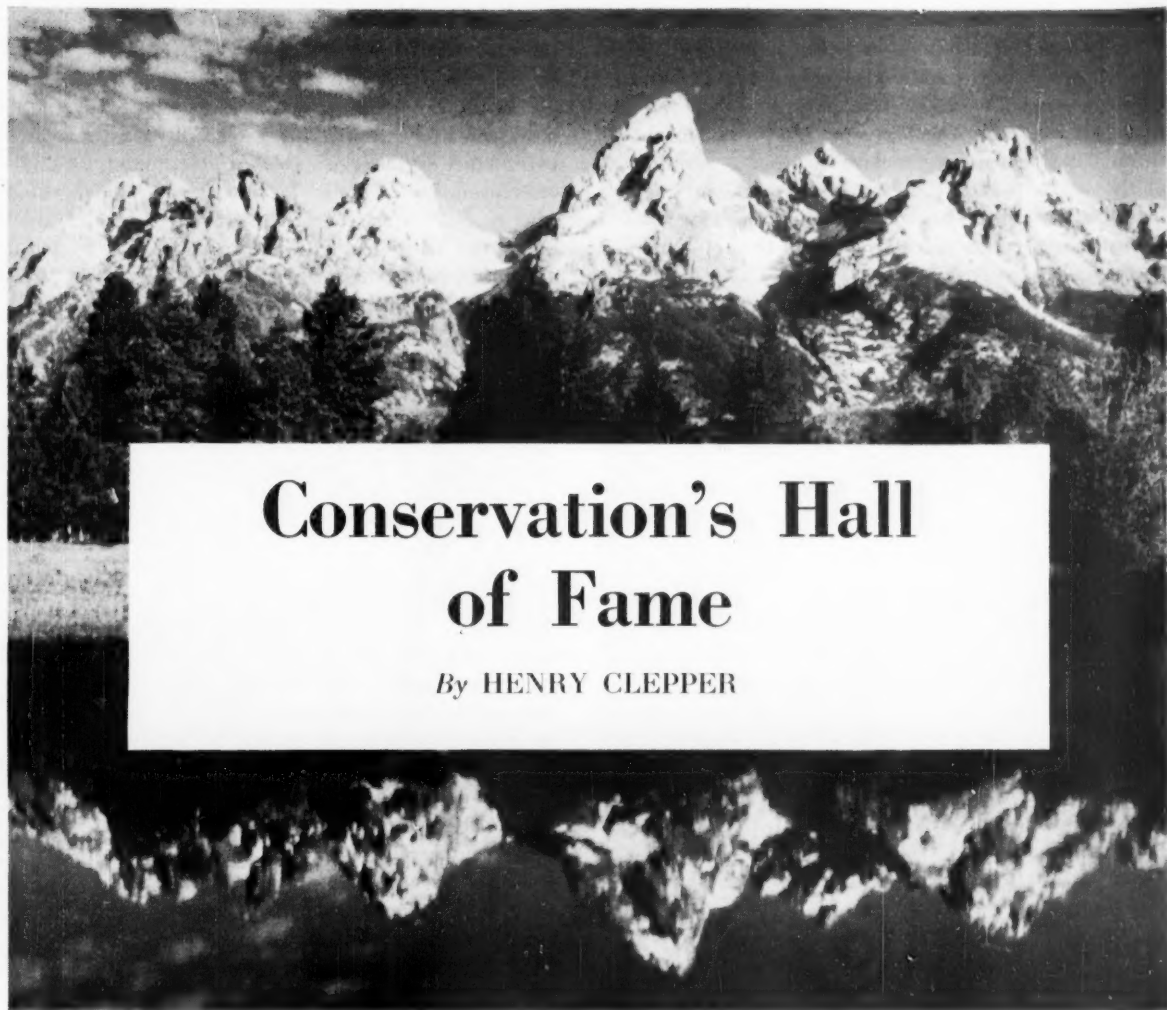
The western form of tree sparrow. Note that it has already been banded and is just posing for its portrait before being released.

and an eight by ten window toward the camera.

Our subjects were common birds trapped in the course of a bird-banding project, and used as models before being banded and released. We learned that, if the birds are placed in the studio box with food and water and the light kept dim, they soon quiet down and make themselves at home. Then, for taking pictures, the box is placed on one end of a table in the work shop, the camera focused on the perch provided for the subject, and the shop made completely dark. The box alone is lit from above with a

feeble flash-light bulb. Under these conditions the birds remain unexcited, do not fly against the window, and with a prod can be moved to a desired pose and position. Eventually we found that we could even open the window and avoid shooting through glass.

The lens distance most used is about 24 inches, or a little less, and the exposure is 1/5000 second at f.45. The film used is Isopan, with the 100 percent over-development usual in electronic flash photography. By this method excellent detail of the birds' markings can be recorded.



Conservation's Hall of Fame

By HENRY CLEPPER

THE conservation movement was conceived, born, grew, and reached its current stage of development as an essential part of our American way of life through the cooperative brains and efforts of many people. Literally tens of thousands of citizens have given unselfishly and devotedly of their time and talents in order that our soil, water, forests, grasslands, and wildlife may be put to their highest use, and preserved for future generations.

Although the concept of conservation—the preservation, restoration, and wise utilization of natural resources—is less than one hundred years old, the application of conservation principles and techniques has profoundly influenced the course of American history, for conservation is dynamic. As a living force its strength springs from the fact that it is based on a practical working ideal.

Theodore Roosevelt thought of conservation as a battle, a conflict between those who would preserve and use wisely and those who would exploit and destroy. In his writings he speaks of “the fight for conservation.” True, the fight is far from won and, unless

Americans are ever alert, can actually be lost. But conservation leaders, the shock troops of the battle, view it as a long, hard campaign in which, while local engagements may result in temporary setbacks, final victory must result if America is to endure.

Whom shall history record as the leaders in the fight for conservation? To answer this question I wrote a representative group of practicing conservationists, actively working in the field.

Specifically, I invited fifty members of the Natural Resources Council of America and representatives of related organizations to name those individuals, living and dead, who have contributed most to the preservation and wise use of our living resources, together with the soil and water that support them. In short, they were asked: Who have been the ten most influential persons in American conservation?

Be it understood that this is not a publicity stunt. It is a serious attempt to determine from the opinions of those representing recognized conservation organizations, the names of those Americans who should be accorded an honored place in history as having notably

influenced the progress of conservation in our nation.

The reader should keep in mind that those whose opinions were sought are not the only persons qualified to express opinions. The opinion poll was limited to this group because of their activity in conservation through national and regional organizations. A number of those who replied obtained suggestions and advice from others, hence their nominations represent a numerical cross section much larger than the actual number of replies received.

Of the fifty questionnaires sent out, forty-two were returned. The results are rather startling as well as revealing.

It was expected that considerable diversity of opinion would result. But I was wholly unprepared for the large number of individual nominations received—a total of 122. This large number is both a revelation

and a source of satisfaction, for it indicates the extent to which many individuals are recognized as having contributed notably to the conservation movement.

Before naming the ten Americans who received the most votes for Conservation's Hall of Fame, I believe two further explanations are desirable. First, for obvious reasons I shall not reveal how the individuals voted who replied to the questionnaire. Secondly, I shall not record the number of votes each of the "ten most influential conservationists" received. To repeat, this is not a publicity stunt, and it is not intended as a popularity poll. Hence, the following list of the ten leading American conservationists is given in alphabetical order without reference to the number of votes each received. However, it is only fair to the reader to explain that the results of the poll were tabulated with the help of disinterested persons.

The Ten Greatest

THE following great Americans have been named as ten most influential men in conservation:

Hugh H. Bennett	John Muir
Jay N. Darling	T. Gilbert Pearson
Ira N. Gabrielson	Gifford Pinchot
Aldo Leopold	Franklin D. Roosevelt
Stephen T. Mather	Theodore Roosevelt

In addition, the following ten men received sufficient votes to deserve honorable mention: Louis Bromfield, Bernhard E. Fernow, Henry S. Graves, William B. Greeley, William T. Hornaday, Harold Ickes, Fairfield Osborn, Paul Sears, Carl D. Shoemaker, and Charles Van Hise.

A mere glance at the list of the ten most influential persons in conservation indicates a fact of importance;

they are typical examples of the best in American democracy. Although representative of different walks of life, and stemming from various regions of the nation, they reveal in the diversity of their interests and personality one common trait—an aggressive belief in the cause for which they worked, or still work.

Some of these men are well known; others not so well known. It is of more than casual interest that although seven of the ten are dead their works have lived after them.

A long account could be written about the life and work of each one. Since that is manifestly impossible in a brief article, the author has perforce had to settle for a thumbnail biographical sketch. Here, then, is the essential information about the chosen ten.

H. H. BENNETT

HUGH HAMMOND BENNETT (born 1881) was raised on a plantation in North Carolina. After graduation in 1903 from the University of North Carolina, where he specialized in chemistry and geology, he entered the Bureau of Soils, U. S. Department of Agriculture, and was assigned to soil surveys.

During the following years he became intimately acquainted with the good earth in all its variety and productivity from coast to coast. It was during this period of mapping and classifying soils that he discovered the process of sheet erosion and how it made rich land poor.

A period of writing and public speaking began about 1918, heightened by his bulletin *Soil Erosion, A National Menace*, issued in 1928 by the Department of Agriculture. This publication attracted not only public attention, but Congressional consideration as well. When, in 1933, five million dollars in relief funds were made available to the Department of the Interior to start a program of soil and water conservation, Dr. Bennett was assigned to direct it.



Then in 1935 a law was passed making the Soil Conservation Service a permanent bureau in the Department of Agriculture, and he was appointed to head it. Thereafter, until his retirement in 1952, Dr. Bennett spearheaded a public campaign of education that resulted in a nation-wide system of soil conservation districts. Today these districts represent one of the most successful experiments in grass-roots cooperation between land owners, state governments, and the federal government that this nation, or any nation, has ever witnessed.

Hugh Bennett's leadership and contributions to this vital program have well earned him the title "Father of Soil Conservation."



JAY N. DARLING

JAY NORWOOD DARLING (born 1876), known affectionately as "Ding" to newspaper readers the nation over, is one of America's great editorial cartoonists. For four decades he has wielded his able and powerful drawing pen to champion the cause of resource conservation.

Following graduation from Beloit College in 1900, he became a newspaper reporter, taking up his life work as an editorial cartoonist in 1913. Through his cartoons on wildlife devastation, destruction of forests, soil erosion, and stream pollution he became a caustic critic of public conservation policies and the failure to give adequate protection to the nation's resources.

His activities were not confined to newspaper cartooning, however. Mr. Darling served on the Iowa Fish and Game Commission, headed the Iowa Conservation Association, and gave money to Iowa State College for wildlife study. Believing that Americans were ruining the finest country in the world by wasting its resources, he frequently said so in word and picture.

When in March, 1934, he was appointed by the Secretary of Agriculture as chief of the Biological Survey—

incidentally, the only official government office he ever held—the administration was criticized for having "bought off its most feared critic with a government bureau." But the criticism was unfounded, for he resigned in November, 1935, after lashing out at the government for impeding wildlife conservation by refusing funds, at conservationists in general for their lack of support, and at Congress for sidetracking needed legislation.

But Mr. Darling did not give up his work in conservation. He continued drawing his powerful cartoons, and when the National Wildlife Federation was organized in 1936, he became its first president. He continues to be one of conservation's most militant champions.



IRA N. GABRIELSON

IRA NOEL GABRIELSON (born 1889) throughout a career spanning nearly four decades has been an efficient administrator of wildlife resources and an active foe of those who would exploit any resources for personal gain at public expense.

After three years as a teacher of biology, beginning in 1912, he joined the old Biological Survey of the U. S. Department of Agriculture, becoming chief of the bureau in 1935. When this bureau and the Bureau of Fisheries were consolidated in 1940 to form the Fish and Wildlife Service of the Department of the Interior, he became the first director, serving until 1946, when he resigned from the government. During his directorship the cooperative wildlife research program was developed, the system of national wildlife refuges was greatly extended, and the successful Pittman-Robertson program of federal-state cooperation was initiated.

When in 1946 he became the first president of the Wildlife Management Institute, he used the resources

of this organization and his wide personal influence to promote improved public administration, management, and research of all renewable natural resources.

The author or co-author of five books and hundreds of technical and popular articles, and an active member of numerous scientific and conservation associations, he is a tireless worker in all fields of conservation, internationally as well as nationally. By all who know him, Dr. Gabrielson is recognized as a great conservation leader whose accomplishments, often attained despite political criticism and public apathy, have helped keep America from becoming a "have-not" resource nation.

Although many men have done much, few have done more to inform people of the urgent need for restoring and properly managing the wildlife and related resources of North America. At the 18th North American Wildlife Conference held in Washington, D. C., in March, 1953, the Wildlife Society awarded him the Aldo Leopold memorial medal.



ALDO LEOPOLD

ALDO LEOPOLD (1886-1948) was an internationally recognized authority on forestry and wildlife management. Born in Iowa, he early developed an interest in natural science, especially ornithology. He studied scientific subjects at Yale and received the master of forestry degree from the School of Forestry in 1909.

During the period 1909-1925 he was an officer in the U. S. Forest Service's Southwestern Region comprising Arizona and New Mexico, where his keen interest in wildlife management was developed. His work with state game associations for a rational system of wildlife management under non-political administration attracted nation-wide attention. Theodore Roosevelt wrote him in 1917, saying: "Your association in New Mexico is setting an example to the whole country." In that year he was awarded the gold medal of the Permanent Wildlife Protective Fund of America.

Becoming associate director of the Forest Products Laboratory at Madison, Wisconsin, in 1925, he served there for two years, then resigned from the Forest Service to conduct game surveys. His book *Report on*

a Game Survey of the North Central States (1931) won him the *Outdoor Life* medal.

He became professor of wildlife management at the University of Wisconsin and thereafter devoted his life to teaching, writing, and advisory work. His book, *Game Management*, is a classic in its field. Through his active membership in many professional, scientific, and conservation organizations he exercised wide influence in land and water policies. He served on the Committee on Wildlife Restoration appointed by President F. D. Roosevelt in 1934.

The Aldo Leopold memorial medal, awarded annually by the Wildlife Society, is named in his honor.



STEPHEN MATHER

STEPHEN TYNG MATHER (1867-1930), architect of our national park system, was born in San Francisco, and was graduated from the University of California in 1887. For five years he was a newspaperman in New York, then returned west to enter the borax business, later becoming the successful president of borax and chemical companies.

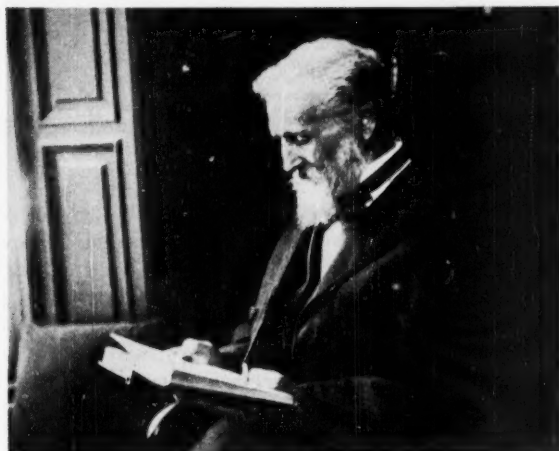
At the height of his business career, when offered appointment as assistant to the Secretary of the Interior, he accepted and set about developing the national parks, of which there were 13 at that time. In the absence of adequate government appropriations, he spent generously out of his own pocket to provide needed park improvements.

When, in 1916, Congress passed the act creating the National Park Service as a separate bureau in the Department of the Interior, Mr. Mather was named as its first director, and served faithfully until illness forced his retirement in 1929. During this period he was instrumental in promoting the establishment of state parks, a movement started about 1920.

Mr. Mather's enthusiasm for parks fired the interest of many other Americans, particularly persons of wealth

who contributed privately to the purchase of groves of trees, land for access roads, and desirable scenic features to add to the system. A magnificent stand of bigtrees now in Sequoia National Park was acquired from private funds, his own and others, and was thus saved from cutting. No one knows the total of his personal financial contribution, but it ran high.

For his outstanding public service in conservation he was awarded many honors, including gold medals and university degrees. He was a great American, who gave up a successful business career in order to devote his life to the preservation of the nation's scenic and historic treasures.



JOHN MUIR

JOHN MUIR (1838-1914), explorer, naturalist, writer, and mountainman, was born in Scotland, but came to America at an early age, and received a collegiate education at the University of Wisconsin.

His was a life dedicated to the outdoors and all Nature, and particularly dedicated to mountains. He was a member of an Arctic expedition in 1878, and made several visits to Alaska, where he discovered Glacier Bay and Muir Glacier. His travels took him to many remote lands, among them Siberia, Manchuria, Japan, India, Egypt, Australia, and New Zealand.

But it is chiefly as an explorer, naturalist, and writer of the Sierra Nevada that he is best known. For a decade he camped and traveled alone in the Sierra, studying and making geological and botanical records. His knowledge of the rocks and forests of the region was unsurpassed, and he is credited with the discovery of 65 glaciers while mapping the high country.

An early and ardent advocate of park conservation, he was largely responsible for the establishment of Yosemite and Sequoia National Parks, but he had an influence on the establishment of others, for through his vivid writings, such as *The Mountains of California* (1894), America first learned of the grandeur of many areas now preserved in national and state parks, forests, and monuments. His book, *Our National Parks*, (1901) is among his chief works.

FOR OCTOBER, 1953

Yale and the University of California awarded him honorary degrees. His name will be honored by Americans as long as the jutting domes and snowpeaks of the high Sierra endure.



T. GILBERT PEARSON

THOMAS GILBERT PEARSON (1873-1943), internationally known ornithologist and wildlife conservationist, was educated at Guilford College and at the University of North Carolina, where he received the B. S. degree in 1899 and the LL.D. degree in 1924.

Following five years of teaching biology, he served as state game commissioner in North Carolina for seven years. He was secretary of the North Carolina Audubon Society during the period 1903-1910; secretary and executive officer of the National Audubon Society, 1910-1920; president, 1920-1935; and president emeritus thereafter.

Founder of the International Committee for Bird Preservation, he was its president for sixteen years, during which period thirty nations joined in its activities. He was also founder and chairman of the National Committee on Wildlife Legislation, and was a member of the advisory board for the Migratory Bird Treaty Act. For years he served as an official collaborator of the National Park Service and the Fish and Wildlife Service.

Decorated by France and Luxembourg for his distinguished service to international wildlife preservation, he was the recipient of other honors, including the John Burroughs memorial medal in 1939.

A prolific writer on wildlife, particularly birdlife protection, he contributed many scientific and popular articles to magazines. He lectured widely over a period of years in Europe and South America, as well as throughout North America.

Editor-in-chief of the three-volume edition of *Birds of America*, he was the author of numerous other books, including his delightful autobiography *Adventures in Bird Protection*; and was co-editor of *The Book of Birds*. But his influence on wildlife preserva-

tion went far beyond writing and lecturing. A strong advocate of protective laws, international as well as national, he was instrumental in obtaining the enactment of much beneficial legislation, both here and abroad.



GIFFORD PINCHOT

GIFFORD PINCHOT (1865-1946), who during his many years of public affairs was active in numerous aspects of resource conservation, will doubtless be remembered in history primarily for his accomplishments in forestry. This is understandable, because he was a professional forester, the first native American to obtain a technical education in this field.

On his graduation at Yale in 1889, he studied at the French forestry school at Nancy, for at that time there were no professional courses in forestry offered in the United States. His career began in 1892 at Biltmore, N. C., where he developed the first systematic plan of forest management. Six years later he was appointed forester and chief of the Division of Forestry, now the Forest Service, of the U.S. Department of Agriculture.

As chief forester, until he was removed by President Taft during the intense Ballinger-Pinchot controversy, he was the architect of the national forest system, now totalling 175 million acres. Moreover, he established the basic policies under which the national forests have ever since been managed in the public interest "for the greatest good of the greatest number in the long run."

Mr. Pinchot was founder and first president of the Society of American Foresters, organized in his office in 1900, the second oldest professional society in America dedicated to the scientific management of a renewable natural resource. During the period 1920-1922 he was commissioner of forestry in Pennsylvania, and twice that State's governor 1923-1927 and 1931-1935.

His aggressive leadership in behalf of forest conservation, backed up by the force of his personality and with the enthusiastic support of Theodore Roosevelt, exercised a profound influence on the whole conservation movement in America.



F. D. ROOSEVELT

FRANKLIN DELANO ROOSEVELT (1882-1945) gave conservation its greatest impetus since Theodore Roosevelt's administration. A large-scale tree planter, he had learned much about forestry even before becoming a state senator. On his election as governor of New York, he promoted the Empire State's great reforestation program and other conservation measures relating to recreation, wildlife, and water.

As President, beginning in 1933, he at once demonstrated his keen interest in conservation, not only of land and water resources, but of human resources as well. With millions of people unemployed, he pushed forward the Civilian Conservation Corps to put idle man-power to work in federal and state forests and parks, on soil erosion control, on watershed and wildlife management, on range rehabilitation, and many similar jobs. It was the greatest undertaking of its kind in history. W.P.A., P.W.A., S.C.S., and other "alphabet" projects of the period all contributed to resource improvement, but, more than that, made millions of citizens directly or indirectly conscious of conservation as something to work at, as a job to be done. F.D.R. is pictured above receiving the medal of the Society of American Foresters.

Mr. Roosevelt's contributions to conservation, and the effects of conservation progress during his administration, are so recent and so well known that further elaboration hardly seems necessary. With the possible exception of Theodore Roosevelt, the United States has never had a President who understood conservation needs as well as F.D.R., and—what is more important—was as ready to do something about them.

THEODORE ROOSEVELT

THEODORE ROOSEVELT (1858-1919) was an outdoorsman and hunter from his youth. His early writings reveal, however, that his interest in forests, waters, and wildlife was primarily that of the sportsman rather

than the conservationist. But on becoming President in 1901 he quickly realized the logic underlying the conservation movement, and its political possibilities as well. T.R. is shown below in a picture from the files of the National Audubon Society talking to an early-day Audubon warden.



Conservation, then being championed by Pinchot and others, was more than a cause. It was a crusade. With characteristic energy and enthusiasm Mr. Roosevelt helped make conservation a popular and burning public issue. In his first message to Congress he criticized the illogical condition then prevailing whereby the government's forests were administered by the Department of the Interior, whereas its trained foresters were in the Department of Agriculture. When in 1905 he signed the law transferring 60 million acres of federal forest reserves (now the national forests) to the Department of Agriculture, he thereby put them under the management of a corps of men educated and trained for that very duty. But he did more than that; by 1907 he had increased, by proclamation, the forest reserves to 100 million acres.

His administration was notable for the development of both national and state forestry policies. The conference of governors at the White House in 1908 was only one of numerous examples of his personal leadership. As President he never hesitated to use the enormous prestige of his office to bring forestry and other conservation causes to public attention for public action. As much as any man, Theodore Roosevelt helped make conservation a household word and an essential part of the American way of life.

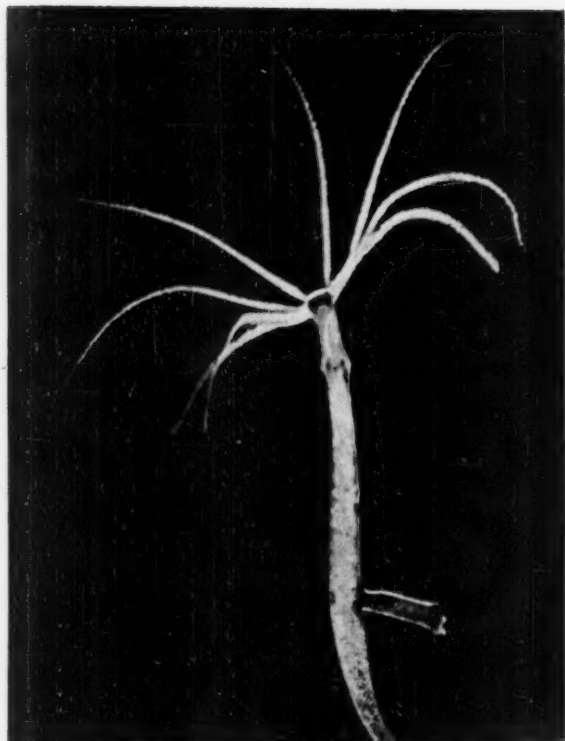
The Selectors

AS PREVIOUSLY mentioned, fifty individuals affiliated with natural resource organizations—representing scientific, professional, and citizen's groups—were invited to nominate the ten most influential persons in American conservation. Forty-two accepted the invitation.

The following are those who helped select Conservation's Hall of Fame:

John H. Baker, National Audubon Society; David R. Brower, Sierra Club; Henry Clepper, Society of American Foresters; Clarence Cottam, Wildlife Society; Harold J. Coolidge, International Union for the Protection of Nature; Waters S. Davis, Jr., National Association of Soil Conservation Districts; Pauline Dyer, The Mountaineers; E. J. Dyksterhuis, Ecological Society of America; Lydia Elzey, National Association of Biology Teachers; Ollie E. Fink, Friends of the Land; Ira N. Gabrielson, American Wildlife Foundation; Tom Gill, American Tree Association; Robert F. Griggs, Natural Resources Council of America; Walter G. Gumbel, Soil Conservation Society of America; C. R. Gutermuth, Wildlife Management Institute; David J. Guy, American Watershed Council; Donald W. Hansen, Better Fishing, Inc.; Herbert C. Hanson, American Society of Range Management; Fred E.

Hornaday, American Forestry Association; Amos L. Horst, Game Conservation Society; Michael Hudoba, Outdoor Writers Association of America; Charles E. Jackson, National Fisheries Institute; Thomas H. Langlois, American Society of Limnology and Oceanography; Stuart Moir, Western Forestry and Conservation Association; Thurlow C. Nelson, American Society of Zoologists; Curtis L. Newcomb, Grassland Research Foundation; Samuel H. Ordway, Jr., Conservation Foundation; Fairfield Osborn, New York Zoological Society; Fred M. Packard, National Parks Association; Richard H. Pough, American Museum of Natural History; Harry E. Radcliffe, American Nature Association; P. L. Ricker, Wild Flower Preservation Society; Mrs. Sylvia Roecker, Women's Conservation League of America; Alfred C. Redfield, Natural Resources Council of America; Paul B. Sears, The Nature Conservancy; Carl D. Shoemaker, National Wildlife Federation; Richard W. Smith, Natural Resources Department, Chamber of Commerce of the United States; George E. Sprecher, American Fisheries Society; William Voigt, Jr., Izaak Walton League of America; Tom Wallace, American Planning and Civic Association; Richard L. Weaver, American Nature Study Society; Howard Zahniser, Wilderness Society.

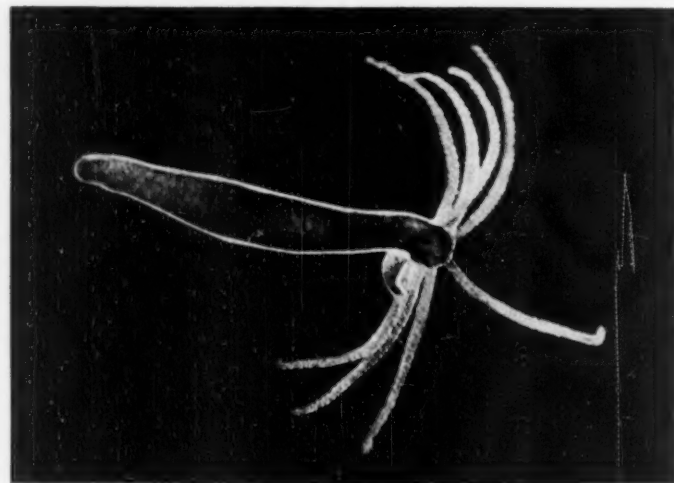


At the left, green Hydra with bud, and, right, the same a few seconds later. At the bottom of the page a green Hydra magnified about 25 times. On the next page a brown Hydra in various poses.

Hydra

IN THE mythology of ancient Greece the Hydra was a monster with nine heads, any one of which, if cut off, would quickly be replaced by two new ones. One of the twelve "labors" assigned to Hercules was the destruction of this dragon. He accomplished his mission by burning the creature with a blazing brand.

Any resemblance between the monster of the old legend and the tiny Hydra of our fresh water ponds would seem remote until we examine the regenerative powers of this little polyp. Then we discover that



By HUGH SPENCER

Photographs by the Author

Hydra can exceed any records credited to the mythical monster.

The Hydra of our lakes and streams is a minute, soft-bodied relative of the corals, sea anemones, and jellyfishes of the oceans. It may measure from one eighth to three-quarters of an inch in length. It has no brain, no heart, no lungs, no blood vessels. It is, in fact, one of the simplest animals known above the level of the Protozoa. In appearance it resembles a miniature vase, or jug, with a fringe of tentacles around the mouth. In simple language it might be described as an animated stomach with a mouth and a crown of whip-like tentacles. The tentacles, five to nine in number, are armed with stinging cells.

Hydra is a sedentary creature, resting most of the time on its base, or foot, while the tentacles radiate in the water, swaying gently like bits of frayed vegetation. It may contract, at times, to pinhead size, with the tentacles showing as short, stubby projections, or it may stretch to full length like a bit of hair with a tuft of smaller hairs at one end. This harmless-looking creature can be, however, swift and terrible death for any small fry such as water fleas, or other microscopic aquatic animals that collide with the dangling tentacles. The poison darts strike quickly,



RECONNAISSANCE



FORWARD



BOARDING HOUSE REACH



DOWN TO EARTH



STEPPING OUT



ON THE MARCH

paralyzing the victim. Then the tentacles close in on the hapless creature, drawing it slowly toward the gaping mouth. The inside of Hydra is little more than a digestive tract, food is taken in and digested, and any indigestible portions are ejected through the same opening by which they came in.

When Hydra desires to move it can do so in several ways. It may glide slowly along on its foot, or it may inch its way ahead by bending over to use its tentacles as a support while it lifts and moves its foot forward, somewhat in the manner of a "measuring worm."

Another means of locomotion is to turn slow "hand-springs" in an over and over movement, resting first on its foot and then on its tentacles. If hydras are present in an aquarium tank they will usually be found on the side nearest the light.

In summer, when food is plentiful, hydras reproduce asexually by budding. A bulge may appear on the side of the body a little below the middle. In a matter of hours this will develop into a small replica of the



SETTING UP EXERCISES



CONFUSION

parent, complete with tentacles. The pair then appear like a form of Siamese twins, but with one member of the twain smaller than the other. Eventually the bud will drop off to become an independent animal. A flourishing hydra may bear, at one time, two or three buds in various stages of development. At times, especially in the fall, Hydra may reproduce sexually, producing egg and sperm cells. The fertilized eggs then drop to the bottom where (Continued on page 444)

Hans Sloane— Father of the British Museum

By LUCY SALAMANCA

ONE afternoon in the middle of September, 1687, two large merchant ships, a yacht bearing a ducal emblem, and a frigate carrying two hundred men and forty-four guns, lay at anchor at Spithead, near Portsmouth, England, waiting for a favorable wind to put out to sea. A week earlier the little fleet had made an unsuccessful attempt to get under way, but unfavorable winds had forced the ships to return to harbor. Aboard the yacht were the Duke and Duchess of Albemarle, their servants, and provisions enough to sustain them on the long and dangerous journey upon which they were embarking—a trip to the New World.

Unquestionably the Duke would have been considered by anyone in England, that September afternoon, the most important member of this expedition. Recently appointed as Governor of Jamaica, he was setting out to represent the Crown in that distant colonial island. Aboard the frigate *Assistance*, however, was a less important member of the Duke's entourage, a young London physician whose absorbing interest had always been Nature and who had acquired, in his spare time, considerable reputation as a naturalist and collector. Fate had a trick in store for His Grace. It was the young physician, not the Duke, who was to achieve fame. Moreover, that fame had its beginnings in this very expedition, for the plants and shells the medical man was to bring back from the Caribbean island were to lead, in a way no one could foresee, to the founding of that great institution, the British Museum. These specimens were to form the nucleus, at the death of Sir Hans Sloane, of a collection that had expanded to such an extent that an Act of Parliament and a building in Bloomsbury were required to house it. That first building was later, in 1881, to reach out to Kensington, where all those items "which are from the hand of God" were to acquire separate distinction as the British Museum of Natural History.

Hans Sloane is receiving great national recognition this year in England. For 1953 marks the centenary of his death and the bi-centenary of the museums his collections founded. Both will be honored by special exhibitions in both Bloomsbury and

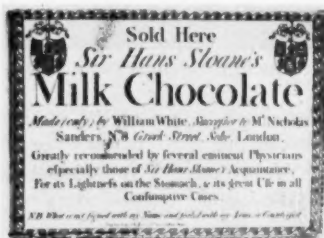


This portrait of Sir Hans Sloane by Sir Godfrey Kneller hangs in the British Museum, which was based upon the Sloane collections.

South Kensington and by general celebration. Also the first biography of the eminent naturalist will come from the press, bearing the title *Sir Hans Sloane and the British Museum*, and written by the Director of the British Museum (Natural History), Dr. G. R. de Beer, F.R.S., especially for this occasion.

One object of all this to-do is to acquaint the English people themselves with their own great man. Curiously enough, the name Sloane, even in the heart of London itself—that great city that was the center of his varied activities and interests—seems to mean to many citizens no more than the name of a fine old Square around the corner from Harrod's, or the name of a London telephone exchange. Even the facts of the life of this eminent naturalist must be dug out of his correspondence, out of old manuscripts, a few scattered scientific articles, and two rare volumes now in the library at Kensington—Sloane's own *Natural History of Jamaica*. This work was frequently cited by Linnaeus, and was the basis of all later taxonomic work on the flora of Jamaica and the West Indies generally; a work that even today has to be consulted in connection with problems of nomenclature and classification.

The fact that Sir Hans is so little known is doubly strange when one



Sloane became interested in combining milk and chocolate and created milk chocolate.

considers that he was a physician so eminent that he was honored by practically every civilized nation during his lifetime. Also he numbered among his friends, acquaintances or correspondents, the intellectual giants of his age—Isaac Newton, whom he succeeded as President of the Royal Society; Linnaeus; Halley; Leibnitz; Boyle; Reamur; Alexander Pope; Samuel Pepys; John Evelyn; John Locke; Aubrey and Hearne; Robert Walpole; William Byrd of Virginia; John Winthrop of Connecticut; Voltaire; Maupertuis; Pontchartrain; Helvetius; Montesquieu, and other extraordinary figures of his extraordinary century.

Sloane was Irish by birth. He was born in Killyleagh, in County Down, on April 11, 1660, in a modest white-washed house. His mother was Sarah Hickes, the daughter of the chaplain to Archbishop Laud, and his father, Alexander Sloane, was receiver-general of taxes from County Down for the Earl of Clanbrassil.

Hans was the youngest of seven sons. Even as a child his interests lay in the direction of natural history.

When he was sixteen he was afflicted with a strange illness, a form of internal hemorrhage that caused him to spit blood. He overcame this handicap, he states, "by temperance, and abstaining from wine and other fermented liquors, and the prudent management of myself in all other respects." But it took him three years to recover from the first attack to an extent that permitted him, in 1679, when he was nineteen, to go to London to continue his schooling and begin his study of medicine. In London he studied chemistry at the Apothecaries' Hall, and botany, anatomy and physics. Here, too, he became the friend of many distinguished scientific, literary and professional men, among them John Evelyn, Robert Boyle, Samuel Pepys and Sir Christopher Wren. After four years' study in London he set out for Paris, accompanied by two colleagues. It was on this journey that he encountered, between Dieppe and Paris, the scientist Lemery.

In Paris Sloane attended the hospital of La Charité and lectures in botany, chemistry and anatomy. This was a period when only Catholics were admitted to taking degrees in the universities of France, and for this reason Sloane had to go to the little town of Orange, in the south of France—not then subject to the sovereignty of the French king—to take his degree of Doctor of Physic. It was certainly not the best choice for anyone to make. It was, in the first place, no more than an examining body that did not provide systematic instruction and it was in poor repute. It was said to confer degrees on "vagabond, ribald, unprofitable, and ignorant scholars who had been refused degrees elsewhere." On July 28, 1683, Sloane, nevertheless, received from them his degree. From a contemporary account of the conferment of the degree we get an interesting picture of Sloane. He was, we learn,



The modest birthplace of Sir Hans Sloane was in County Down, Ireland.

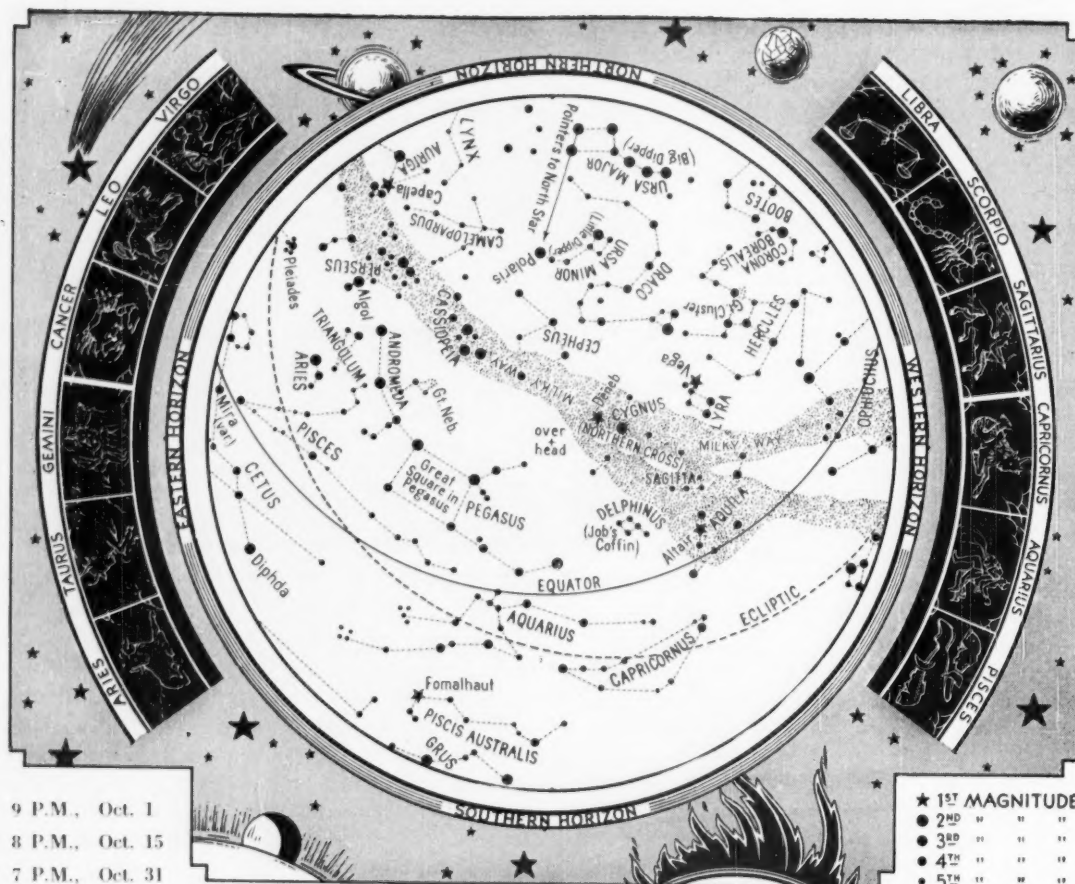
"of medium height, hair very short, light chestnut, face rather long and grave, marked with smallpox." He was 23 at the time.

Sloane next went to Montpellier to complete his studies in botany and anatomy. He left that city on May 23, 1684, and by a leisurely route "came again to London with a resolution to fix himself there for the exercise of his profession," as the Thomas Birch manuscript states.

In London the physician associated himself with Dr. Thomas Sydenham, the most celebrated physician of that day. Sloane progressed to such an extent that on April 12, 1687, he was admitted as Fellow of the Royal College of Physicians. In this year he was invited by the Duke of Albemarle to accompany the ducal fleet to Jamaica, serving as physician to the family and, later, to care for the medical needs of the islanders. Although many of Sloane's friends tried to dissuade him, the thought of adding to his rapidly growing plant and other collections made too strong an appeal and he accordingly consented. His journals, meticulously kept throughout the voyage to Jamaica, indicate this intense, ever-present interest in plant and animal life.

Once in Jamaica, the scientist studied with interest and concentration every aspect of the island, its flora and fauna, its inhabitants, its geography, and he collected thousands of plant and mineral specimens. He also kept meteorological records and studied the local folk-lore. It was out of this wealth of material that his *Natural History of Jamaica* was written. The first volume of this important work came out in 1707; the second did not appear until 1725. It was while he was in Jamaica that Sloane became interested in chocolate to be combined with milk as a food. Years later, in London, he manufactured the first "milk-chocolate."

Sloane married Elizabeth. (Continued on page 442)



To use this map hold it before you in a vertical position and turn it until the direction of the compass that you wish to face is at the bottom. Then, below the center of the map, which is the point overhead, will be seen the constellations visible in that part of the heavens. It will not be necessary to turn the map if the direction faced is south.

The Unseen Stars

By ISABEL M. LEWIS

THE maximum number of stars that are within the range of vision of a keen-eyed observer who looks skyward on a clear, dark, moonless night—in a position far from city lights, haze, and smoke—cannot exceed about 3000. Only under superlatively fine seeing conditions may he expect to see that many. Even a little moonlight and atmospheric haze may reduce the number that may be seen by as much as one-half. Yet when the seeing is fine one has the feeling that he is looking at a sky studded with countless stars.

With such slight optical aid as field-glasses one will have within his reach something like 50,000 additional stars that are invisible to unaided vision. The astronomer Argelander, in compiling his *Durchmusterung* of stars of the northern hemisphere, observed 324,000 stars with a 2½-inch telescope. It has been estimated that more than a billion stars brighter than the 20th

visual magnitude, as distinguished from *photographic* magnitude, could be detected with the 100-inch Mt. Wilson reflector. The 200-inch Hale telescope on Palomar Mountain reveals stars fully one magnitude fainter visually than can be seen with the 100-inch, and stars nearly as faint as the 23rd magnitude have been photographed with the Hale instrument. A star that is about 2½ times—2.512, or the square root of 100, to be exact—brighter than another is one unit smaller on the stellar magnitude scale. This is whether one is considering apparent magnitude, or absolute magnitude, which is apparent magnitude at a standard distance. A star of 1.0 magnitude is 2½ times brighter than one of 2.0 magnitude.

Sirius, the brightest star in the heavens, is of minus 1.6 magnitude on the apparent magnitude scale, and is about 1100 million times brighter than a star of the

21.0 magnitude, barely visible in the 200-inch telescope. If all stars were of the same intrinsic luminosity, were uniformly distributed in space, and there was no obstruction of the light of stars because of cosmic dust or gaseous matter in interstellar space, then the total number of stars brighter than any named magnitude would be increased by four times that number of stars if the named magnitude were increased one magnitude. This would result in a rapid increase in the number of the fainter stars as the volume of space increased outward from the observer. Although there is actually a great difference in the intrinsic luminosity of the stars, some supergiant stars giving forth 10,000 times as much light as our sun, and some feebly luminous stars less than one ten-thousandth as much light as the sun. There is, even so, a great increase in the number of faint stars. This increase is greatest in the Milky Way, where, near the galactic center, there is a dense crowding of faint stars. But even where there is a thinning out of stars near the poles of the galaxy, this increase in the number of faint stars is still great, even up to the limit of visibility of the most powerful telescopes. How many still fainter stars there are in the heavens beyond the reach of all existing telescopes cannot be estimated with any degree of accuracy. It is most probable that the number of the *unseen* stars, including those in the extragalactic systems, in globular clusters, scattered singly in space occupied also by cosmic dust and gaseous matter, and, above all, in our own galactic system, far exceeds the number of stars within reach of our greatest telescopes.

It was once believed that the great dark areas in the Milky Way, such as the dark rift extending from Cygnus to Scorpio, the extensive dark patches and apparent "holes" and irregular dark streaks, were vacant stretches or breaks in star-filled regions. Now they appear as dark, gaseous matter and cosmic dust, often of great extent, at times faintly illuminated by brilliant associated stars. It may be that at greater distances and hidden behind these vast, impenetrable regions lie other similar ones, as well as fields of unseen stars extending to distances of many light years. The nature of the regions beyond would depend chiefly on the structure of the Milky Way itself in its different parts. Its general structure is clearly seen to be the same, although apparently on a much larger scale, as that of the extragalactic systems that have been studied so extensively with the 100-inch Mt. Wilson reflector, and about which much more may be discovered with the aid of the 200-inch reflector on Palomar, which is so specially adapted to the investigations of these far distant objects. Most of these galaxies, lying far ex-

terior to our own, are so distant that their most brilliant stars cannot be seen individually. Yet how many billion suns may exist in some of the most distant of them, ranging in luminosity from massive supergiants to feebly shining, dwarf suns giving a small fraction of the light of suns such as our own!

The mass of our own galaxy has been estimated to be equivalent to that of 200,000 million suns. Half of this matter has been assumed to be in the form of cosmic dust and gaseous nebulae, and the remainder in the form of stars. Some of these may be massive, luminous suns millions of miles in diameter, others, almost planetary in size, may barely shine with their own light, as with nearby Barnard's Star, so-named for its discoverer. This star has the greatest known proper motion—that is motion across the line of sight—and the fact that this motion has been observed to be variable indicates that this star is disturbed in its motion by the gravitational attraction of a still fainter body. Barnard's Star is itself a faintly shining body that gives forth only four ten-

thousandths as much light as is emitted by our own sun. Its distance from the earth is only six light years so it is the second nearest known star. It is of the tenth apparent brightness, and to be barely visible to a keen eye as a star of sixth magnitude its distance would have to be decreased to about $1\frac{1}{4}$ light years. The existence of a companion to this faintly luminous sun raises the question of whether its companion is an unseen star or a relatively massive planet emitting no light or heat radiations of its own. There are many double and also multiple stars, star-systems in which a massive companion star may be unseen itself but sway appreciably the motion of a brighter star. The two stars then revolve about a common center of gravity.

A planet differs from a star in that it shines only by reflected light from a star about which it revolves, and gives forth no light or heat of its own. It also is a body that has very small mass relative to the body about which it revolves. The least massive of all the stars whose masses have been determined has only about one-seventh that of our sun. One-tenth the mass of the sun is generally assumed to be the limit below which a less massive body would cease to shine by its own light.

The mass of the planet Jupiter is slightly less than one-thousandth of the mass of the sun. It gives forth no light or heat of its own, shining only by reflected light from the sun. If it were revolving about the brighter component of the visually double star, Alpha Centauri, the nearest star, in an orbit of the same size and shape as that in which it revolves around the sun it could not be seen shining (Continued on page 444)

Lady Beautiful

By G. PATRICIA RUMMEL

Venus, mysterious lady of the sky,
Why clothe yourself in clouds so dense,
Why be so haughty, still so shy?
Oh gracious lady, you outshine
Your siblings and the million suns
When farthest from your twin; then humbly fade
As nearer back to earth you come.

The School Page

By E. LAURENCE PALMER

Professor Emeritus of Nature and Science Education, Cornell University, and Director of Nature Education, The American Nature Association

Joshua in Reverse

DURING the first half of my life I often hoped that fortune would sometime smile on me and make it possible for me to "go West." I believed that bigger trout grew in the West than I could catch in the East. I even believed some of the stories about how fast plants could grow and animals could run out there. And I still think that there is some basis for the well-known western enthusiasm.

When, in my early twenties, I got an opportunity to teach in Iowa I fully expected to see Indians and maybe a few buffalo roaming the plains. I actually did see a few prairie chickens in territory where they now no longer exist. But Iowa was not and is not the West.

In my early thirties I got my first opportunity to go to the coast. I have been there many times since, and have always enjoyed it. The day before this was written I had just returned to the East from California so that fact naturally colors the nature of this page this month.

I shall never forget the morning I woke up on a Pullman and looked out into a dim dawn to see passing by tree-like forms, which I immediately recognized as Joshua trees. Then I knew I had gone a considerable distance beyond the regions where the tall corn grows. At last I was in the West. Somehow Joshua trees have ever since been to me the symbol of the West, and I doubt that I shall ever forget those wierd forms flitting by the Pullman window back in June, 1922.

I remembered from Sunday school that Joshua had led his followers over the Jordan and taken possession of the promised land. It seemed eminently appropriate that Joshua trees should become to me a symbol of the part of America that rivals even Texas and Florida with promises for the good life. I will wager that I am not the only person to whom the first glimpse of a Joshua tree brought a feeling of pleasure and satisfaction. Long live the Joshua trees, say I.

A few moments ago I glanced through a set of Kodachromes I took a few years back, when I led an expedition of graduate students through the West. I was surprised to notice how many pictures I took of these giant lilies, and I well remember the enthusiasm of the students when they first saw these favorites of mine. And I am particularly pleased that we have a National Monument where these plants will presumably be allowed to grow under governmental protection. I rather think that they will need it, and I regret that many of these plants outside such protected areas seem to be doomed to destruction by commercial interests.

I reminded you earlier that our Biblical Joshua took over the promised land. I chose "Joshua in Reverse" as the title for this page because it looks as though California, the promised land for so many Americans, might take over the Joshua trees with unfortunately disastrous results. My reasons for holding this belief are specific, recent and first hand, not from general hearsay.

A little more than a week ago I was riding merrily along one of California's splendid highways, trying to escape the heat of the lowlands and enjoy a cool respite in the hills. I was on my way to Idyllwild to visit the Idyllwild School of Conservation and Natural Science, sponsored, together with the Idyllwild School of Music and Arts, by the Idyllwild Arts Foundation. The school and its director, Dr. Max Krone, came up to my finest expectations. It seemed to me that here someone had the

wit, courage, intelligence and ability to bring together the arts and sciences in a spectacularly appropriate natural setting, and that such unity would be bound to result in effective education. Dr. Robert Durbin, directing the School of Conservation, and Dr. Krone, directing the School of Music and Arts, were both most happy choices, and one of the reasons why I now wish to return to California again is to see more of that remarkable school in action.

You may well think that I have led you a bit around Robin Hood's barn in this article. We have Joshua trees, Joshua and a couple of summer schools in our cast of characters now. Well, California is a state of contrasts. You can get any kind of climate and I presume any kind of people you want if you hunt long enough. I sweltered one day, and the next day was in a town where the morning temperature was 32 degrees. The highway I referred to earlier runs from Long Beach to Idyllwild, and passes through the town of Orange. It was in that town that I met Joshua in reverse.

As we whizzed merrily down the street of Orange, well within the speed limit, I noticed, behind a building, a great pile of tree stumps. Since the light was good for a picture, and might not be so good on my return, we reversed our route and came back to see what was cooking. I found that the building housed a concern engaged in manufacturing a special kind of fertilizer. An obliging employee gave us some data on the pattern of a day's work, and I got busy with my camera before leaving. We were told that the basis of this industry were the stumps of Joshua trees. These looked quite different from the Joshua trees I first saw from the Pullman window, but they were Joshua trees all right. I ventured a guess that they must use a relatively small number of the trees in a day's operations, only to be informed that an ordinary day's run used up about 200 Joshua tree stumps, and they had to be the stumps of living trees not the stumps of dead plants. I learned that the trees were all taken from private lands and that the industry had been running nearly ten years. I neglected to learn whether the harvest was seasonal, and limited to a few weeks or days in a year, but I gathered that such was not the case. Whatever the length of the season, I could not quite grasp one industry in California, the promised land, using up 200 Joshua trees a day without feeling that maybe the worm had turned and that the promised land was taking over Joshua not Joshua taking over the promised land.

I think I know Californians well enough to know that there are plenty of them to whom Joshua trees mean as much as they do to me. I have no desire to curb legitimate industry, but when I was told that, to the extract from the Joshua trees, was added a good amount of urea, I rather wondered if the Joshua trees really were so important that they needed to be sacrificed at the rate of 200 a day. Maybe the urea without the Joshua trees would provide a satisfactory fertilizer. Maybe the Joshua trees are used more as a sales talk. I just do not know. I do know that when my plane flew back east over Joshua tree country I looked down on it with no little nostalgia, stimulated by three decades of experiences with the plants, and wondered how many of the trees would survive the next three decades if they continued to be used to the extent I was advised they were being used in that one California town. I saw no plantations of Joshua trees designed to guarantee a sustained yield. If such a plantation is in existence, and its location is known by any of my readers, I wish I could be informed about it. I would gladly visit it and give it the publicity it deserves. If, on the other hand, we have here, again, the destruction of a limited resource it is only fair that the story be made known to a wide audience.

Apparently there are four Joshuas mentioned in the Bible. Before writing this I read the 6th Book of the Old Testament from beginning to end. Since the initial E. in my name stands for Ephraim, I suppose that the first and most important of the Biblical Joshuas was an Ephraimite. Somehow, when I read of the merciless way in which Joshua pursued his enemies, and of the behavior of some of his spies, and of the way he glorified slaughter, conquest and annihilation of those who opposed him, I lost some of the pride I had in the name Ephraim. Frankly I have a few reservations about Joshuas being able to make the

sun and moon stand still "about a whole day" so that he could kill a few more enemies. It seemed to me that at that point Joshua's enthusiasm must have run away with itself.

Of course there is no logic in semantics. The fact that my name is Ephraim and that Joshua was an Ephraimite is of no more significance than that Joshua overran the promised land, and now the promised lands of our West are overrunning the Joshua trees. It is interesting however that the Book of Joshua in the Bible reeks with destruction, and that Joshua trees in California are now being destroyed, I think needlessly. Frankly I prefer a more moderate outlook on life. The accounts Joshua gives of his conquests read too much like the news in the papers of the last two and a half decades to suit me.

Freedom and Plenty

Freedom and Plenty; Ours to Save. By Wilfrid S. Bronson. New York. 1953. Harcourt, Brace and Co. 124 pages. Illustrated by the Author. \$2.95.

Through one valley flows the Muddy-flow, laden with soil from a denuded and eroding mountain, past ill-managed farms. It flows through an area from which wildlife has gone and by communities growing poorer every day from the waste of basic natural resources. Through another valley flows the Cleargood, having its source high among a managed forest. Along its banks are farms where the soil is conserved and topsoil does not run off into the stream. Wildlife abounds, and communities are prospering. These two valleys are created by Wilfrid Bronson in this excellent introduction to conservation, a little book that appears to be the answer for any school that wishes to give its pupils a basic picture of our natural resource problems. The text appears to be directed to the third to sixth grade level. It is graphic and completely understandable. No less effective than the text are the author's illustrations, which carry real messages with good sense and good humor. So far we have seen no conservation book for the younger audience that can compare with this one in its lively presentation of a vitally important subject.

Biochemistry

General Biochemistry. By William H. Peterson and F. M. Strong. New York. 1953. Prentice-Hall. 469 pages. Illustrated. \$6.50.

The style in this textbook is as simple as possible in the light of the subject covered, and it constitutes a clear account of the knowledge of the biochemistry of animals, plants and micro-organisms. The volume has wide application to such fields as chemical research, medicine, nursing, research and the whole inclusive field of biochemistry. It takes into account recent developments in the areas of plant metabolism, hormones and energetics.

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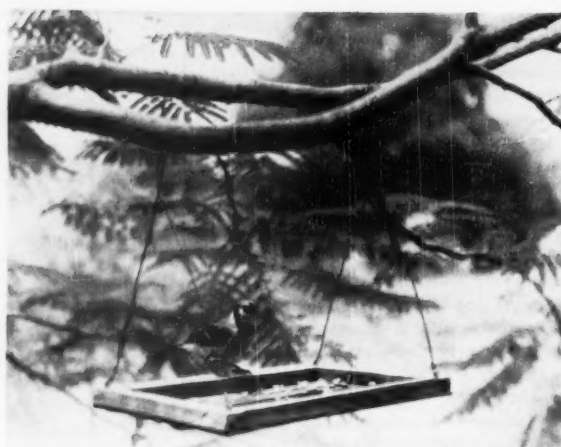
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All the mouse trap arrangement caught was a rapidly departing bluejay. In the brief interval between snap of trap and shutter click the bird had gone.



The old string method of photography is slower, but it does get results. The shutter speed for this picture was 1/90 at f/11.

Camera Trails

By

EDNA HOFFMAN EVANS

HAVE you ever had a perfectly wonderful idea that fell flat on its face when you tried to make it work? That is what happened to me not long ago. It is funny, and I can laugh at it, but down deep inside there is a sore place that hurts. I suppose all great inventors, from the time inventing first began, have felt like that when some idea or other did not pan out. But then they buckled down and tried it again. That is what makes the thing called progress.

Of course my idea was not world-shaking, or anything like that. Nor was it exactly my own. It was something I had read about in a book on photography, and then tried to adapt to suit my own situation. The book called it "mouse trap photography" and it really looked like a snap.

To begin with, I like remote control photography—or, more specifically, string photography. I like to set up the camera, focus it on some likely spot, tie a string to the shutter release, and then go some distance away. When my subject returns to the place on which the camera is focused—usually it is a nest, a feeding tray, or some otherwise baited spot—I pull the string and take the picture.

The trouble with that procedure, as I have found through long experience, is the length of time it takes for the pull I give at one end of the string to reach the shutter release at the other. Often the subject has time to move completely away before my pull takes effect on the shutter. Result—one nicely exposed

negative without any real subject in it.

The mouse trap, I thought, would solve my problem. It would be much more "hair trigger" than just the string. Its action, in turn, would pull the shutter release much faster than I could from a distance. At least that was the way it seemed in the abstract.

As is often the case, the photography book did not go into much detail as to ways and means of setting up the mouse trap. But the word "revamped" was used, and that seemed to indicate that some changes were necessary before the trap set-up would be successful.

I do not approve of traps, not even to catch mice. But, I decided, if a mouse trap would help me take better pictures, I was all for it. So I went down to the nearest variety store, invested a nickel in a trap and a dime in a pair of wing bolts. Then I began "revamping." I caught my fingers an uncomfortable number of times before I had the thing figured out, but eventually I rigged up a wire that fitted into the notch where the bait was usually fastened—that was a more substantial trigger than the original one, and yet it could be released with a slight jerk.

Next, I bored two holes in the wood base of the trap, and through another piece of wood the same size. The upper portion of my tripod legs are in two parallel sections, so with the trap in front and the board in back, the wingbolts held the device firmly in place. So far, so good. Now for the strings. There was a short one running from the camera shutter release to the wire portion of the trap, and, by experiment, I discovered just how long it had to be in order to trip the shutter when the trap was sprung.

Another string was attached to the trap where the bait normally would be, and this led through a couple of screw eyes on the tripod legs (to give the correct direction to the pull) across the yard, and in through the kitchen window.

In preparation for the big experiment

and several days before the final touches had been made, I had built a new bird feeding tray, hung it in a light place, and, by liberal use of sunflower seeds, had persuaded the local cardinals and bluejays that it was a good place to get a meal. It was a perfect set-up (so I thought) and already I was planning ways in which I could use the same equipment in situations more "uncivilized" and less controlled than was my back yard feeding tray.

As you can see, my idea had entailed considerable preparation and planning. It did not, fortunately, cost much. But it looked like a natural. I adjusted the camera, tested the strings, listened with approval as the trap snapped and the shutter clicked. It sounded fine. So I loaded the camera magazine with twelve pieces of 4 x 5 cut film, took a final look at the connections, tested the light, adjusted the lens stop, pulled the slide, and withdrew to the end of the string in the kitchen. The trial run was beginning.

I did not have to wait long before the first customer put in an appearance on the feeding tray. Subject number one was a bluejay, obligingly perched on the edge of the tray, facing the camera while he selected the sunflower seed that he wanted. I pulled the string. The trap snapped and the shutter clicked. The bluejay flew away—whether or not he took his sunflower seed with him I was too excited to notice.

Now the film had to be changed and the camera re-set. That is the chief trouble with this kind of photography. You have to go back to the camera, tinker around, and scare away the subjects between every exposure. Fortunately, though, they usually come back again after a time.

To make a long story short, in the course of two days I made twelve exposures and I was pretty well pleased with myself. Of course, I admitted modestly, not every one was perfect. There was the time when the trap went off all by

itself; apparently I had not set it properly. Then there was the time I caught my finger in it while re-setting. Also, there was a time when I pulled a little too late and my bird had already flown, and another when I forgot to readjust the curtain aperture to get the proper speed. But, all in all, I was well satisfied. Particularly I was counting on the shot where two cardinals were sitting on the tray at once.

Being without darkroom facilities at the time, I took my film to a commercial developer to be processed. That is why I shot the whole twelve before stopping. The 24-hour wait seemed interminable, but finally it passed and I called for my film. For some reason or other I did not look at them in the shop, but I could not resist a comment about the mysterious new system of photography that I had perfected. I wondered why the man behind the counter looked a little puzzled.

In the car I settled myself for a good gloat as I opened the neat little envelope containing my film (I had not asked for any prints because I wanted to select the best of the lot from the negatives). The first film was fine, except that it showed nothing but the feeding tray, nicely in focus. Oh well, thought I, that is the one that went off prematurely. So I looked at the second one; nothing on it but the feeding tray. Another of the misses, I thought. But the third was a feeding tray, and so was the fourth, fifth, sixth, and straight on through number twelve. Not a bird picture in the lot. Something was wrong!

I went through them again, slowly this time. Ah, yes, by looking carefully, I was able to see a faint blur, or possibly the tip end of some tail feathers in several of them, evidence that a bird had been there and gone—fast!

It was not difficult to see what had happened, once I sat down and studied the situation. The system was fine, except for one seemingly small but very important defect. The snap of the trap was too sharp and frightening, and there was too much of an interval between it and the click of the shutter. True, the interval was extremely short, but there were two definite and distinct noises; even my far-from-sensitive ears could detect them. Obviously, the snap frightened the wild creatures that had survived as a group only because their ancestors had learned long ago to fly and fly fast when any sound or movement suggested danger.

No amount of tinkering, no attempts to soften the noise by rubber pads or other silencing devices seemed to do any good. The mouse trap might catch a mouse, but it could not take the picture of a bluejay or a cardinal. My brilliant idea was a dud. I could laugh when I admitted defeat to my friends. Of course, I had bragged about it beforehand, but none the less I was chagrined and disappointed.

So, just to show that I could, I went

back to taking pictures with my string. It is slower and perhaps not as spectacular, but at any rate, it does work.

I wonder, however, whether the mouse trap idea is a complete failure. Somehow, I doubt it. I wonder, for example, whether it might work if the camera were farther away from the subject (I was working at rather close range) so that the sound might not be so sharp and alarming. I also wonder whether some animal subjects might be a bit slower in moving out of range. After all, the interval between snap and click is so short. Maybe something the size of a bear or an elephant might not move so swiftly.

The problem now is to find a bear or an elephant!

CORRESPONDENCE

THE recent section on bas-relief prints brought an interesting letter from Miss Mary Gamble of Route 3, Bozeman, Montana. Miss Gamble, who admits that she has seen a half century of progress, says she became interested in taking snapshots when she was in her thirties, and in microscopy when she was in her forties, which only goes to prove my theory that photography is a timeless and an ageless hobby.

Miss Gamble writes that she has no enlarger, so she made her bas-reliefs with a contact printer, using a negative and the positive print, instead of a negative and a positive transparency. "I placed the negative over the print and adjusted it to get the best results," she wrote, "taped it and made a contact print on No. 3 Kodabromide paper which proved to be extremely fast. After several test strips I found the best exposure to use." For the final print she used No. 4 Kodabromide paper, slipped some of this paper under the negative to cut down the light, and gave it two counts. Her subject was a sleepy looking cat, and a very interesting relief picture was the result.

It is nice to see what other photographers are doing along paths that parallel the "Camera Trails."

FILM GUIDES

IT IS funny how things become a habit. As summer turns to fall each year I have come to look forward to the arrival of the movie and slidefilm guides published and revised annually by the Educators Progress Service of Randolph, Wisconsin. This fall, as usual, both guides contain more listings than the previous editions.

For educational, social, and service groups interested in obtaining visual aids material as a low cost (actually, no cost at all) the guides are invaluable. Unfortunately, not all subjects lend themselves to pictorial representation; others are particularly well adapted to visual presentation. Among these latter are the fields of science, social studies, ap-

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plied arts, and health education, to mention only the major headings.

Among the new biology films listed this year are "Battle of the Beetles," dealing with the harmful spruce bark beetle in Colorado, "Challenge: Science Against Cancer," "Canaries Are Fun," "Nature Activities for Camp, Club, and Classroom," as well as films showing activities at Audubon camps in California, Maine, and Connecticut.

If you are interested, the guides will tell you how to get these pictures—for free. They are well worth what they cost—\$6 for the film guide and \$1 for the slidefilm—please mention "Camera Trails" when you order.

Watkins, Photographer

Mount Watkins is known to a great many visitors to Yosemite National Park but relatively few realize that it is named in honor of one of that area's outstanding photographers of an early day, Carleton E. Watkins. He was a pioneer photographer of the West and a notable recorder of western scenery. He is believed to have taken the first picture of a sequoia, in 1858 or 1859. An interesting brief story of Watkins by Ralph H. Anderson appears in the April, 1953, issue of *Yosemite Nature Notes*.

Add Refuge Lands

Addition of 9185 acres of land by purchase, and 1783 acres by lease, to the refuge system of the U. S. Fish and Wildlife Service is announced by Secretary of the Interior Douglas McKay. One new refuge has been added, the Shiawassee National Wildlife Refuge in Saginaw County, Michigan. The federal refuge system now comprises 272 areas containing 17,409,968 acres.

British Angling

An Angler's Garland. By Eric Parker. London, 1953. Carroll and Nicholson. 320 pages. \$2.50.

This is an anthology of angling; an attempt—and a successful one—on the part of the author to compile a little book that will bring together the best that has been written on the sport of angling. It can be slipped into one's pocket and taken along for quiet perusal while sitting on a stream bank waiting for a bite.

For Fly Fishermen

Advanced Fly Fishing. By Eugene Burns. Harrisburg, Pa. 1953. The Stackpole Company. 268 pages. Photographs by Clyde Childress; drawings by Firman Bradway. \$7.50.

Fly fishermen will find this book, which deals with modern concepts of the use of dry fly, streamer, nymph, wet fly and spinning bubble, of special interest. It is a practical book by an angler who writes against a background of wide experience.

HANS SLOANE

(Continued from page 435)

daughter of John Langley, Alderman of London. She was the widow of a man he had met in Jamaica. They had four children, a son, Hans, and a daughter, Mary, both of whom died in infancy, and two other daughters. With prosperity, Sloane purchased the historic Manor House in Chelsea, which later contained his collections. At the same time he acquired proprietorship of the famous Apothecaries' Garden, in which he had always been interested, and where a statue of him now stands. He added to his collections continuously, and they now included man: antiquities and other "curiosities." Some idea of the extent of his botanical collections alone may be gained from the fact that the Sloane Herbarium now fills 334 large folio volumes in the Department of Botany in the British Museum of Natural History. His library eventually exceeded 40,000 volumes, of universal scope, although with specific emphasis on medicine and natural history. Before Sloane died he made a will in which he provided that his museum be placed in the care of trustees, who were to offer it to the King for the nation, provided his daughters, the Countess of Cadogan and Mrs. Stanley, were paid the sum of 20,000 pounds. He died January 11, 1753, at the age of 93. Some time later the necessary sum was raised, by means of a lottery, to acquire not only the Sloane collection, but also the Harleian collection of manuscripts and the Cottonian library. The building erected to house these treasures was located in Bloomsbury and was the first British Museum.

Many honors were conferred upon Sloane in his long and distinguished career. He had served as Physician to Queen Anne, and continued as Physician Extraordinary to George the First. In 1716 he was appointed Physician-General of the Army, and on April 3 of the same year George the First conferred on him a baronetcy, one of the earliest instances of an hereditary honor having been bestowed upon a physician. Supplementing his degree from Orange, he had an M.D. from Oxford in 1701. In 1705 he was made a Member of the College of Physicians of Edinburgh, and in 1719 was made President of the Royal College of Physicians. The degree of Doctor of Medicine was given him by Dublin in 1743. He served fourteen years in the presidential chair of the Royal Society, editing its *Philosophical Transactions*, but declined to stand for reelection when he was eighty-one because of the "bad state" of his health. He received similar honors abroad, from France, from the Prussian Academy, from the Academies of St. Petersburg, Madrid and Göttingen. When he died he had been a Fellow of the Royal Society for sixty-eight years, the longest period that any individual has held membership.

SUPPER FOR DROSOPHILA

(Continued from page 412)

Drosophila can reach the point of satiety. Watching him sip his nectar with eager delight, I decided to refresh my memory on him and his kind. I turned to reach for an encyclopedia volume in a nearby bookcase. When I looked once more at the desk, *Drosophila* had flitted away.

Some hours later, while I was seeking sleep via the murder mystery route, a fruit fly appeared, hovering within the pool of light from the bedroom lamp. I liked to think it might be my little companion of earlier in the evening. Would his life span, I wondered, be shortened by the Lucullan banquet I had provided? Averaging a week, the fruit fly life span is sometimes extended to as much as three weeks by adverse conditions making for slower metabolism. He is even known to hibernate on occasion, thus reducing his metabolism to practically nil and making possible a spring awakening to active living. Surely such a feast of carbohydrate would make his little life burn with a faster flame. Yet, I reflected, a short and merry life is not without its compensations. And the very rapidity with which his generations crowd upon each other has given him a stellar role in the science of genetics. Thanks to this quick fecundity of his, much has been learned regarding the laws of heredity, such laws, for example, as those governing sex-linked characters or those determining the characters of the hybrid.

Musing thus, I closed the covers of the murder mystery. My own metabolism at last demanded sleep. I smiled good night to the little fellow as I snapped off the light.

Between Tides

Between the Tides. By Philip Street. New York, 1953. Philosophical Library. 175 pages. Illustrated. \$4.75.

This is a popular treatment, by a British writer, of the fascinating life found in tidal waters and along the seashores of Britain.

ANSWER TO TREE QUIZ

(Pages 417-420)

1. Red Ash, *Fraxinus pennsylvanica*.
2. Sweet Gum, or Red Gum, *Liquidambar styraciflua*.
3. Black Tupelo, *Nyssa sylvatica*.
4. Sugar Maple, *Acer saccharum*.
5. Mountain Ash, *Sorbus americana*.
6. Sycamore, *Platanus occidentalis*.
7. Butternut, *Juglans cinerea*.
8. Ailanthus, *Ailanthus altissima*.
9. Hornbeam, *Carpinus caroliniana*.
10. American Hophornbeam, *Ostrya virginiana*.
11. Catalpa, *Catalpa bignonioides*.
12. American Yellowwood, *Cladrastis lutea*.
13. Basswood, *Tilia americana*.
14. American Beech, *Fagus grandifolia*.
15. Common Hoptree, *Ptelea trifoliata*.

CONSERVATION AWARDS

Creation of an annual \$5,000 awards program for professional contributions in the field of conservation of natural resources have been announced by George W. Mason, president and chairman, Nash-Kelvinator Corporation. Recognition will also be given to non-professional contributions.

The nationwide program will be known as "Nash Conservation Awards." Ten cash awards of \$500 each will be presented to ten professional conservationists, working in education, research, administration or enforcement, in any field related to soil, water, forest, fish or wildlife conservation. In addition, 10 awards consisting of plaques and citations will be given to non-professionals whose contributions to conservation have been performed as acts of good citizenship.

"The real sportsman has prize enough in his big musky or record grizzly, but there should be greater recognition for those who are devoting so much to the cause of conservation," Mason said. "We hope these awards will serve as a reminder to all of us that conservation today is a science, and without expert conservationists there would soon be no fish or game left. It is also important to stress the fact that all phases of the problem are related—including soil, water, forest, fish and wildlife conservation."

Nominations for awards are to be made by newspaper rod-and-gun and conservation editors, rod-and-gun clubs, and public and private conservation agencies. Final selections will be made by the Awards Committee, which for 1953 consists of Ed Dodd, creator of "Mark Trail"; Pieter Fosburgh, editor of the New York State Conservationist; Johnny Mock, outdoors editor of the Pittsburgh Press; Alastair MacBain, chief of Information Bureau, U. S. Fish & Wildlife Service, and Michael Hudoba, Washington correspondent and authority on conservation legislation.

This year's awards will be presented at a dinner in Washington, in January, 1954.

Morrow Juniors

Zoo Babies. By William Bridges. New York. 1953. William Morrow and Co. 95 pages. Illustrated. \$2.50.

True stories of animal babies at the New York Zoological Park, written by the Park's curator of publications and illustrated by photographs of the animals.

Microbes at Work. By Millicent E. Selsam. New York, 1953. William Morrow and Co. 95 pages. Illustrated by Helen Ludwig. \$2.00.

Simple yet informative story of the various microbes that work for man and without which we would have no cheese, pickles, bread, penicillin, or many other products.

Tiger. By Robert M. McClung. New York. 1953. William Morrow and Co. Illustrated by the author. \$2.00.

A simple little story for the youngster,

telling, in elementary text and picture, the life story of the swallowtail butterfly.

Knowing Spiders

How to Know the Spiders. By B. J. Kaston and Elizabeth Kaston. Dubuque, Iowa. 1953. Wm. C. Brown Co. 220 pages. Illustrated. Spiral binding, \$2.25; cloth binding, \$3.00.

This is the latest addition to the fine Pictured-Key Nature Series. It provides keys to identification and knowledge of the more common spiders and contains suggestions for collecting and studying them. In a foreword the authors point out: "Familiarity with spiders dispels the almost universal fear with which they are regarded, and in a world full of fears we can very well do with one less." They express the hope that this key will open the door to a wider enjoyment of Nature through appreciative acquaintance with spiders. It certainly should accomplish this objective.

Succulents

Succulent Plants. By A. Bertrand. New York. 1953. Philosophical Library. 112 pages. Illustrated in color and black and white. \$4.75.

This book is devoted to the succulent plants, other than cactuses, and to those that are of horticultural interest, either by reason of their beauty or their extraordinary appearance. The author has concentrated on those that are in cultivation and some that he feels should be better known.

Bees

The Perilous Adventures of the Golden Princess. By Mina Maxfield. Boston. 1953. The Christopher Publishing House. 201 pages. Illustrated by Betty Bruner Buckman. \$3.00.

This is an anthropomorphic story of the life in the bee hive and of other "people" of Nature that the bees encounter in the course of their work. Frankly, because we can stand very little human conversation and rumination on the part of bees, hylas, spiders, ladybugs and others, we did not get far enough into this book to discover its accuracy. However, it may interest those who prefer to acquire their knowledge of bees and their life through this kind of treatment.

Genetics

Textbook of Genetics. By William Hovavitz. Houston 6, Texas. 1953. The Elsevier Press. 420 pages. Illustrated. \$5.95.

In this up-to-the-minute textbook the author presents a clear discussion of knowledge today of the science of genetics. His presentation is logical and orderly in arrangement. Even the chapter going into probabilities, and thus involving a heavily mathematical treatment, covers the ground in understandable fashion.

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THE UNSEEN STARS

(Continued from page 437)

in the reflected light of the close, bright star even with the aid of the 200-inch telescope. Moreover, its mass relative to that of the star is so small that its gravitational effect upon it would be too minute to be detected. There is no reason why one should not believe that there are many planetary bodies existing unseen in space in revolution around seen or unseen stars; but only one quite massive relative to the sun about which it revolves and a comparatively near neighbor of our solar system could possibly be detected by any means now at our disposal.

It may be that the unseen body affecting the motion of the nearby and faintly luminous Barnard's Star is a dark, relatively massive planetary body, rather than a companion star shining too faintly to be seen, even telescopically.

There is an unseen body in the interesting star-system 61 Cygni, which is only 11 light years away, with a mass only about sixteen times that of Jupiter. It is an invisible attendant of one of the visible pair in 61 Cygni, revolving around it in five years. If a body ceases to shine by its own light and can no longer be considered to be a star when its mass is less than a tenth that of the sun, then this dark body with a mass far below this limit must be regarded as a planet of the bright star rather than a companion sun. It is known to be present only by the slight gravitational effect it produces.

The faintest stars, although they exceed enormously the brighter stars in number, contribute little to the total light received from the stars. It is a far simpler matter to estimate how much light is received from all the stars combined than it is to give any estimate of their total number. It could be shown that about 1100 stars of visual magnitude 1.0 would, combined, give more light than reaches the earth from all the stars in the heavens. The number of stars visible in the heavens of 1.0 magnitude or brighter is only 12. There are twenty-one of 1.5 magnitude or brighter.

During the month of October, Mercury will be an evening star but poorly placed for observation even when at greatest eastern elongation on October 23. Venus is visible, low in the eastern sky, before sunrise. On October 4 it will be in close conjunction with Mars, which is now in Leo a few degrees east of Regulus early in the month but passes into Virgo late in October. Mars will rise about three hours before the sun and may be seen in the east before sunrise. Jupiter rises late in the evening and will be the most brilliant object in the heavens—aside from the moon—until Venus appears before sunrise. It will remain in Taurus throughout October. Saturn will be in conjunction with the sun on October 23, but too close to it to be observable during the month of October.

HYDRA

(Continued from page 433)

they have a chance to survive the winter.

Regeneration may be described as the power possessed by some animals to replace lost or injured appendages and organs, or to renew certain parts of the body that have been amputated. Lobsters and other arthropods may reproduce lost claws, legs, antennae, or other parts. Earthworms and some other worms can be severed and each part survive to become a whole animal, certain salamanders and lizards can grow new tails if those members are removed. Starfishes may develop new arms if needed, or may even survive being cut in two, each portion recovering to become a whole animal. It remains, however, for lowly, brainless, little Hydra to do all of these and much more.

A little more than two centuries ago Abraham Trembley, in Holland, astonished the scientific world of his time, and brought to Hydra a fame that has survived through all the years since 1744. Trembley discovered that if he cut a hydra in two each part promptly recovered and reassembled its parts to become a complete Hydra, tentacles and all. Further experiments disclosed that a hydra could be severed into as many as eight pieces and each would survive to become a whole animal. If a hydra were cut in two and the parts placed together they would fuse to become a whole animal. If slit down the middle, leaving the basal parts attached, he created a hydra with two heads. He even turned one inside out and it continued to thrive and flourish in a normal manner!

In scientific laboratories throughout the world Trembley's experiments have been repeated and confirmed, over and over again, through the more than two hundred years since he first made his fantastic discoveries. Further experiments have disclosed that if several hydras are chopped into hash and left in a dish of water, a number of new hydras will emerge from the carnage within 24 hours.

In both plant and animal life we find certain relationships between organisms of different kinds, wherein two may live together in a kind of partnership, or community life, which is beneficial to both. Such a relationship is called *symbiosis*. The algae and fungi partnership of lichens is such a union. Termites depend on minute protozoans living within their intestines to aid in the digestion of the cellulose that is their principal food. The nitrogen-fixing bacteria found on the roots of peas, clover and other leguminous plants is another example of *symbiosis*. The green Hydra also has its symbiotic associate. The green color is caused by microscopic, unicellular green plants, called *Zoochlorella*, living within the cells of the outer wall of the animal. These plants contain chlorophyll and use the sunlight to make starch. The Hydra is believed to benefit from the oxygen released in this process.

Two kinds of Hydras are common in our ponds and streams, the green Hydra, and the brown Hydra. The latter is the larger of the two. The behavior of both is similar. To collect Hydras, gather a quantity of pond weeds, or other aquatic plants, and keep them in clear water in an aquarium for a few days. Careful examination with a hand lens may then disclose a few of the creatures attached to the plants, or to the glass of the tank. To keep them healthy and thriving they should be provided with plenty of water fleas, or other small crustaceans. Quantities of these may be netted from the waters of the pond where the Hydras were obtained.

An ordinary drinking glass with a bit of pond weed could provide an adequate environment for a number of Hydras and their associates. Such a miniature menagerie can provide hours of entertainment for the owner, as well as amusement for friends and guests to whom you show your interesting pets and explain their amazing accomplishments.

Bulletins Received

"Roadside Protection in California." This is a handbook for local action and is published by the California Roadside Council, 1239 Merchants Exchange Building, San Francisco. . . "Popular Game Fish and Angling Lures." Published by The Stackpole Company, Harrisburg, Pa., and completely illustrated in color, with pictures of both fishes and lures. \$1.25. . . "Northern's Ginger and her Woodland Orphans." Published by Carl O. Marty, Jr. of Northern, Three Lakes Wisconsin. True story of a dog and his wild friends. \$1.00. . . "Fifty Years of Forestry at Michigan State College." Published by the Department of Forestry, Michigan State College, East Lansing Michigan. . . "Specialists at Technology Center." Listing of administrators, scientists and teachers available at the Illinois Institute of Technology, Chicago 16, Illinois, for speaking engagements, press interviews and radio and television appearances. . . "Spin Tackle Fishing." Description of a new way to fish by Lee Harter and Tom Carlile. Available for 75 cents from Trend, 5959 Hollywood Blvd., Los Angeles 28, California.

Physical Society

From London, The Physical Society, 1 Lowther Gardens, Prince Consort Road, London S. W. 7, comes word that they have been receiving increasing inquiries from overseas respecting the activities and publications of the Society. There is also active interest in a Reprint Service that has recently been inaugurated. To meet this interest a booklet descriptive of the organization has been prepared, as well as information about its services. These data will be sent on request to the address above.

THE READER'S MARKET

A place where members of the American Nature Association and readers of Nature Magazine may find many interesting offerings or may advertise themselves, at low cost, for things wanted; things they have for Sale, for Trade, for Sale or Trade. This is an excellent forum for acquiring or disposing of such items as binoculars, books, cameras and photographic equipment, magazines, sports and outdoor equipment, etc.

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UNDER THE MICROSCOPE

By JULIAN D. CORRINGTON

Famous Lost Slides Discovered

SHERLOCK HOLMES'S MOUNTS UNEARTHED,
GOOD AS NEW

LONDON, W. C. 2:—While here attending the Coronation festivities, we spent some time renewing old friendships and revisiting old haunts. High on our list was, of course, 221B, Baker Street, where we were gratified to find the present custodian no less willing than former incumbents to let us browse about rather as we pleased. Nothing seemed changed. Over here was the Persian slipper, still half-filled with shag tobacco; there the well-stocked tantalus, and, nearby, that strange and complex gadget of the Victorian world, the gasogene. We observed some dottels from the Master's pipe on the mantel. The chemical apparatus on the acid-stained, deal-topped table; the violin in the corner—nothing appeared altered, not even redecoration for the bullet-pocked wall had been permitted.

We spent some time rummaging through several of the ponderous commonplace books, reading again the unpublished data in the case of Wilson, the notorious

canary-trainer, and the colossal schemes of Baron Maupertuis, late of the Netherland-Sumatra Company. We puzzled, too, in reviewing some of the manuscripts of Dr. Watson's literary agent, over the curious duplication of introductions, the first occurring in *The Resident Patient* and the second in *The Adventure of the Cardboard Box*. You remember the passage about the thermometer at ninety presenting no hardship to the tropic-tempered Watson, the absence of anything of interest in the news, the rising of Parliament, and the yearning for the glades of the New Forest or the shingle of Southsea. There follows the celebrated section in which Holmes unobtrusively observes a series of facial expressions unwittingly performed by the good Doctor, then breaks in on his train of thought—

"You are right, Watson. It does seem a very preposterous way of settling a dispute." Whereat both Watson and the reader are utterly confounded until the detailed, step-by-step explanation is forth-

comi g. then—

"It was very superficial, my dear Watson, I assure you. I should not have intruded it upon your attention had you not shown some incredulity the other day."

All at once, in an obscure corner of an old tin box, we came upon a small packet that we unwrapped, revealing a container, inside which were two microscope slides. It took a few moments for the unprecedented nature of this discovery to sink in, but then in a flash it came to us that here was an item to dwarf all other news in importance, a find that would indeed crowd the Coronation itself onto the second page of all press releases. For these two slides had been made by Sherlock Holmes himself! They were actually the work of his own hands! There could be no doubt about it; they bore labels in his own well-known script. One was designated "St. Pancras police murder," and the other carried the legend "Charing Cross coiner."

Moreover, these very slides are described by the Master himself, one of them in detail, in the Sacred Writings. The opening paragraphs of *The Adventure of Shoscombe Old Place* will recall the particulars:

Sherlock Holmes had been bending for a long time over a low-power microscope. Now he straightened himself up and looked round at me in triumph.

"It is glue, Watson," said he. "Unquestionably it is glue. Have a look at these scattered objects in the field!"

I stooped to the eyepiece and focused for my vision.

"Those hairs are threads from a tweed coat. The irregular gray masses are dust. There are epithelial scales on the left. Those brown blobs in the centre are undoubtedly glue."

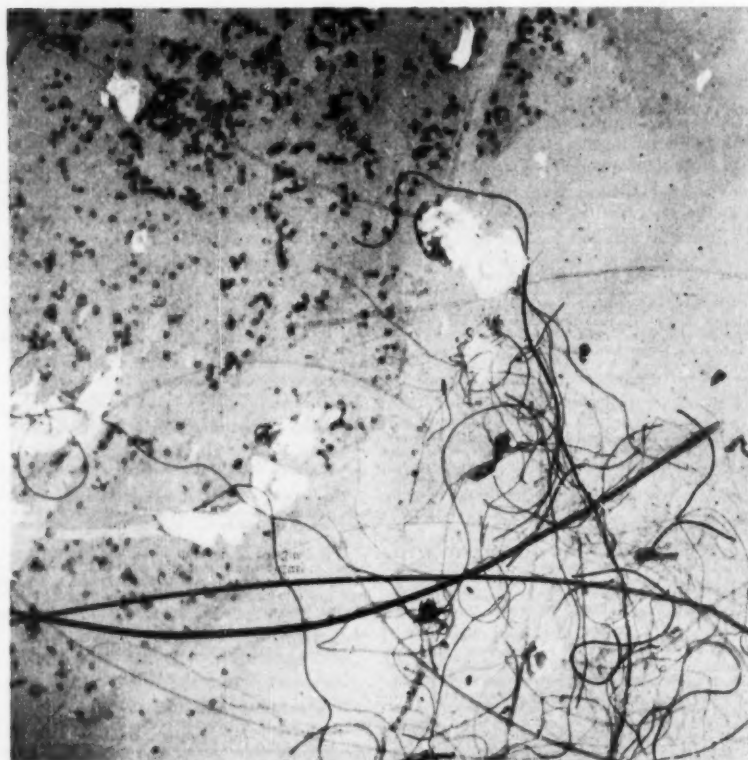
"Well," I said, laughing, "I am prepared to take your word for it. Does anything depend upon it?"

"It is a very fine demonstration," he answered. "In the St. Pancras case you may remember that a cap was found beside the dead policeman. The accused man denies that it is his. But he is a picture-frame maker who habitually handles glue."

"Is it one of your cases?"

"No; my friend, Merivale, of the Yard, asked me to look into the case. Since I ran down that coiner by the zinc and copper filings in the seam of his cuff they have begun to realize the importance of the microscope."

And so these priceless slides, long thought lost or destroyed, have come to light. The unique nature of this discovery is further emphasized by the fact that these two are the only permanent mounts for the microscope ever known to have been made by the Master. We obtained permission to make photomicrographs of these slides, and herewith present them as a small but important addition to the many memorials to, in Watson's words (*The Final Problem*), "him whom I shall ever regard as the best and the wisest man whom I have ever known."



St. Pancras police murder. Tweed fibers at bottom, with particles of lint and dirt; epithelial scales on left; large whitish masses are glue, 20X.



Charing Cross coiner case. Copper shavings show as brighter than zinc; lint, dirt, and wool fibers present, 20X. Both illustrations made with oblique surface illumination and remote backgrounds.

BEGINNER'S PRIMER

WE HAVE surveyed many odd kinds of flies thus far, with weird shapes, structures, or habits, but with the exception of the Bee Louse (Aug.-Sept., 1951), they are commonplace compared with those yet to come. Although we are almost through with the long list of families in the Diptera, those remaining include some of the most spectacular cases of extreme adaptation to be encountered anywhere on earth. That so completely aerial a creature as a fly could become an obligatory internal parasite of mammals seems perfectly incredible—yet such is the case in a number of families, the larvae or maggots dwelling within the bodies of horses, cattle, sheep, and other warm-blooded hosts.

The Gasterophilidae comprise the botflies of horses, with about twenty old-world species placed in the single genus *Gasterophilus* (stomach-lover) by some authors, or scattered through five genera by others. The hosts affected are mostly members of the horse family, including asses, mules, and rhinoceroses. Two species infest elephants. Either rarely or accidentally, bots may be found in such unrelated hosts as man, dog, or rabbit.

Three species have become introduced to America and are often all too common. *G. intestinalis*, the common horse botfly, stomach bot, or nit fly, is now cosmopolitan and is the best-known form. Adults are around two-thirds inch in length, somewhat resemble honeybees, and are found flying about horses, which give many signs of an instinctive fear of them. These insects have large compound eyes and also ocelli; the antennae have a bare arista

(bristle) and lie sunk within facial grooves; the mouthparts are degenerate, with wide palps but a short and weak proboscis; the wings are large and dark-spotted, with a tendency for a band across the center. The abdomen of the male is rounded, but that of the female tapers to a point, generally carried under the body, pointing forward. The ovipositor is well-developed and protractile.

The business of fertilized females is that of laying eggs on horse hairs, and our three species are largely identified by their selective habits in this matter. *G. intestinalis* patronizes the foreparts of its equine victim; the front legs, chest, and belly, but particularly the long hairs found on the inside of the foreleg. *G. nasalis* (*veterinus*), the throat or chin botfly, a smaller species with unspotted wings, oviposits along the jaws, under the chin, and on the throat, sometimes also on the forelegs. *G. haemorrhoidalis*, the nose botfly or red-tailed botfly, has a bright orange-red tip to the abdomen, unspotted wings, and lays its eggs on the horse's lips. To do so, it buzzes about the host's nose, whence the name "nose botfly."

The eggs or nits of these pests are minute objects fastened to hairs and should be prepared as objects for the microscope without removing them from the hairs. They are pale yellowish and somewhat triangular, apex pointing down, toward the base of the hair. It is believed that these eggs will not hatch unless and until licked by the victim or scratched by his teeth. This liberates the minute larva, which is thus brought into the mouth. It was formerly thought that they were then merely swallowed, but they are now

known to make their way actively through tissues to the stomach. Here they attach to the lining mucosa by means of two pairs of strong mouth hooks; chitinized processes interesting as slide mounts. Here they dwell as active parasites, and their numbers may reach huge totals, with every available portion of the entire stomach wall completely taken over by these bots. One wonders, indeed, how it is possible for a horse to survive such an infestation.

Attached by a pointed end, each larva or bot is a stout cylinder, from one-half to nearly three-quarters inch long, ringed with spines at the segments. While too robust for a slide whole mount, the chitinized skin, cleared by potashing, can be flattened out and mounted with the mouth hooks attached, to show chief adaptive features. The animal winters-over in this phase, the bots enduring from one summer till the next spring. Then they pass from the host with the dung, enter the ground, and pupate, using the last larval skin as a puparium, later emerging as winged flies. What a subject for an allegory!

*The horse's mane is full of bots
While mine has only ulcer-spots.
I wish my ulcers could essay
To sprout some wings and fly away.*

PLASTIC COVERSGLIPS



WE ARE in receipt of a trial package of *Ezo-Kelon Plastic Coverslips*, and can recommend them to our readers as having a great deal of merit. Ward's Natural Science Es-

tablishment reports: "Advantages are especially in economy. The Coverslips are unbreakable, optically quite good. Fine for temporary mounts, since easily handled. Indispensable in beginning courses." The cost runs about one-fourth that of glass.

Other points are that these covers are non-curling and will not cut the fingers. They are cheap enough that it is more economical of time and effort to throw away used covers instead of cleaning them, although they are readily cleansed in alcohol. Available in four sizes of circles, five of squares, and twelve of rectangles; packed 100 to a box with divider between every hundred. The 18 and 22 mm squares or circles are also obtainable in boxes of 100. Most popular is the 22 mm square cover, accounting for about 90% of all sales. Uniquely, among cover prices, the circles cost no more than the squares. All squares and circles and the smaller rectangles are the same price: \$4.50 per thousand. The remarkably low price of \$3.00 per M is obtainable in large orders, of 10M and up. The larger rectangles are somewhat higher.

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NEW BOOKS

Zoogeography

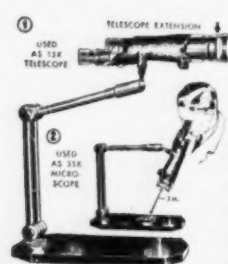
THE standard work in this field, widely known by its authors' names as "Hesse-Allee-Schmidt," has now appeared in a second edition. Based on Richard Hesse's pioneering work, *Tiergeographie*

auf oekologischer Grundlage of 1924, the first edition was an English translation, with changes, deletions, and additions by the American coauthors, and was published in 1937 with the title *Ecological Animal Geography*. Now, with the same title, the revisions and rewritings have been so extensive as to result in practically a new book. Professor Hesse has passed away, but his name is still retained in the new edition.

In this volume, the present-day distribution of animal life on our planet is interpreted on a basis of the fossil record (historical zoogeography) and the relation of the animal to its environment (ecological zoogeography). It is the only book in this

field that gives equal emphasis to the three major habitats;—the sea, the freshwaters, and the land. The revisors have been at pains to simplify terminology, to incorporate all pertinent recent publications in the chapter bibliographies, to bring the material up to date, and to provide a background for the present interest in conservation. The book is a mine of information, incident to detailed studies of distribution, on such matters as classification, environmental factors, migration, barriers, and many other topics. It is well written and documented; possibly a little shy on illustrations. Pp. xiii, 715; figs. 142. John Wiley & Sons, Inc., 440 Fourth Ave., New York 16, 1951. \$9.50.

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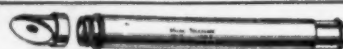
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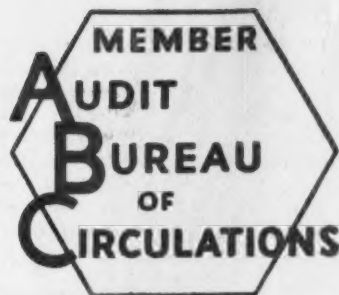
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Economic Entomology

HOW toxic to human life is DDT? Will spraying this substance kill off our song birds? Which insecticide is best to eradicate chinch bugs, and how should it be applied? These are but samples of the myriad questions answered in the pages of *Insect Control by Chemicals*, a voluminous and authoritative work by A. W. A. Brown, Head of the Department of Zoology and Applied Biology, University of Western Ontario, at London, Canada. These questions are, however, of very minor importance in evaluating the worth of this excellent piece of investigation. Instead of dealing only with current methods of control that would soon be outmoded, Dr. Brown uses most of his space for fundamentals and general methods of pharmacological and physical control, making his book a source work of permanent value for further research and developments. This is the first book to trace the connection between the molecular structure of a chemical and its toxicity. Although technical, especially chemically, the writing is in easily read style and has as much detail as possible relegated to references so as to keep the reader's attention on main themes. There are 2300 of these references, an indication of the exhaustive treatment.

Insecticides of the present day are described as to chemical structure and behavior, and in various vehicles and combinations for use. Organic chemicals and their toxicity to insects are fully discussed, then detailed treatment of insect anatomy and physiology as required for an understanding of how insecticides enter and act. After a chapter on the pharmacology of insect poisons, there follows one on the equipment developed to apply insecticides and another on applications from aircraft. Toxicity to man and domestic animals, to plants, and chemical control of insects receive full treatment, and the last chapter deals with insecticides and the balance of animal populations. No one in this line of work, in field or laboratory, can afford to be without this important contribution. Pp. vii, 817; tables 93, figs. 101. John Wiley & Sons, Inc., 440 Fourth Ave., New York 16, 1951. \$12.50.



The Hallmark of Circulation Value

Three thousand four hundred and fifty advertiser, agency and publisher members of the Audit Bureau of Circulations have a voice in establishing and maintaining the standards responsible for the recognition of this emblem as the Hallmark of Circulation Value. It represents the standard of value that these buyers and sellers of advertising space have jointly established as measurement for the circulation of printed media.

The basis for arriving at the advertising value of a publication is the Bureau's single definition of net paid circulation. With this as the standard, the circulation records of A.B.C. publisher members are audited by experienced circulation auditors. As specified in the Bureau's Bylaws, A.B.C. auditors have "access to all books and records."

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NATURE MAGAZINE

UNIVERSITY MICROFILMS
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FREE

His M-1 Jammed!

Corporal
Rodolfo P. Hernandez, U.S. Army
Medal of Honor



0200 HOURS! Suddenly the pre-dawn blackness on Hill 420 split into crashing geysers of orange flame. Behind the barrage, yelling, firing, hurling grenades, a horde of Reds pushed up the hill toward G Company's position.

A hot fire fight began. It lasted several hours. Finally, suffering heavy casualties, G Company began to withdraw. Corporal Hernandez stayed, throwing grenades and firing his remaining rounds.

Then his M-1 jammed, with a ruptured cartridge in the breech. Fixing his bayonet, he leaped out of his foxhole and disappeared in the darkness toward the attacking Reds. They found him in the morning, wounded, ringed with enemy dead. But he had stopped the attack—alone.

"A man couldn't fight at all," says Corporal Hernandez, "if he weren't fighting for good things—peace, and a job, and a chance in the world. That's why I'm thankful to all the people like you who've put so many billions into Bonds. Bonds help fight Commies, sure. But they're also a stockpile of prosperity—for you; for our country. A guarantee to men like me that we can come home to a secure future."

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Now E Bonds pay 3%! Now, improved U.S. Series E Bonds start paying interest after 6 months. And average 3% interest, compounded semi-annually when held to maturity. Also, all maturing E Bonds automatically go

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